Proposed Retail Center – North Adair Street/North 4th Avenue

Cornelius, Oregon

Prepared For:

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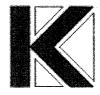
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Project No. 7059.00

August 2005



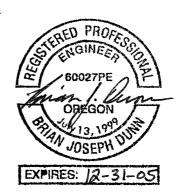


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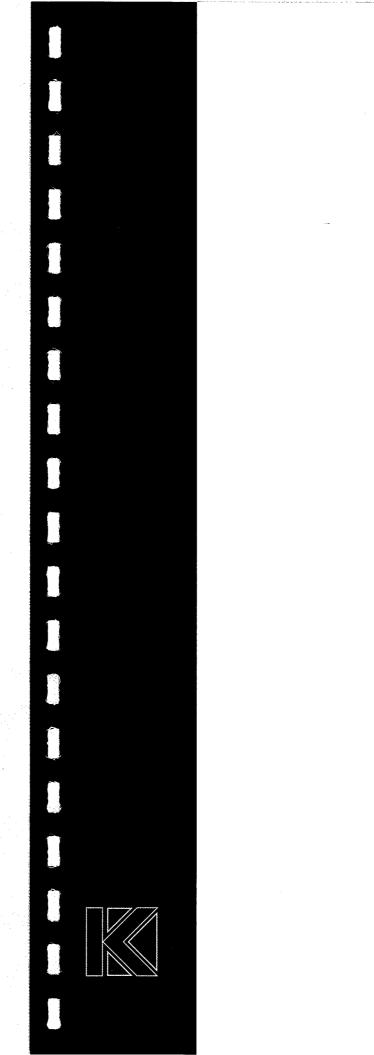
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Section 1

Executive Summary

Executive Summary

The Applicant, PACLAND, is proposing to develop retail center in the northwest quadrant of the North Adair Street (OR 8)/North 4th Avenue intersection in Cornelius, Oregon. The development site is primarily vacant with several homes located along the site frontage of North 4th Avenue. The proposed development is expected to be built out and operational in 2006.

This study evaluates the near-term transportation impacts associated with the proposed retail center. A majority of the site (13.25 acres) is currently zoned C-2 Commercial with a small portion (2.67 acres) located along the North 4th Avenue site frontage zoned A-2 Multi-Family Residential. As part of the development application, the Applicant is seeking to change the current site zoning from a mixture of C-2 Commercial and A-2 Multi-Family Residential to entirely C-2 Commercial.

Since the proposed zone change will require an amendment to the City's Comprehensive Plan, the Applicant is required to address the requirements of Oregon's Transportation Planning Rule (TPR), which implements Statewide Goal 12 (Transportation Planning). A report has been prepared under separate cover to demonstrate that the proposed new plan designation for the A-2 portion of the site can comply with the TPR (Reference 1).

The proposed development will be accessed from three external site-access driveways: one rightin/right-out driveway on North Adair Street (OR 8), and two driveways on North 4th Avenue. Permitting of the proposed site-access driveway to North Adair Street (OR 8) will require a major deviation process according to ODOT Division 51 procedures.

The results of this study show that the proposed retail center can be developed while maintaining acceptable traffic operations and safety at all study intersections and surrounding roadways in the site vicinity, assuming provision of the recommended mitigation measures. The following sections summarize the study findings and conclusions. Additional details of the study methodology, findings, and recommendations are provided within this report.

CONCLUSIONS

Existing Conditions

During the weekday a.m., weekday p.m., and Saturday mid-day peak hours, all study area intersections currently operate within performance standards deemed acceptable by the City of Cornelius and ODOT, with the exception of the North Adair Street/North Yew Street intersection. The minor street approach in the southbound direction is currently operating at or near capacity during the weekday p.m. peak hour. This intersection operates acceptably during the other study time periods, and does not meet signal warrants.

Year 2006 Background Conditions

- Year 2006 background traffic conditions (without the proposed retail development) were estimated assuming one year of continued local and regional growth. Additionally, the traffic associated with five approved, or in-process developments identified in the site vicinity by City staff was accounted for in the analysis of year 2006 background conditions.
- Operational analysis of year 2006 background traffic conditions indicates that all of the study intersections are forecast to operate within acceptable standards during the weekday a.m.,

p.m., and Saturday midday peak hours, with the exception of the North Adair Street/North Yew Street intersection. The southbound approach to this intersection is forecast to continue operating at or near capacity during the weekday p.m. peak hour, and not meet traffic signal warrants.

Proposed Development Activities

- The site is expected to generate approximately 6,570 net new daily trips, with approximately 140 net new trips occurring during the weekday a.m. peak hour, 600 net new trips occurring during the weekday p.m. peak hour, and 940 net new trips occurring during the Saturday mid-day peak hour.
- Access to the site is proposed via three external driveways: one right-in/right out unsignalized driveway onto North Adair Street (OR 8) and two unsignalized driveways to North 4th Avenue.

Year 2006 Total Traffic Conditions:

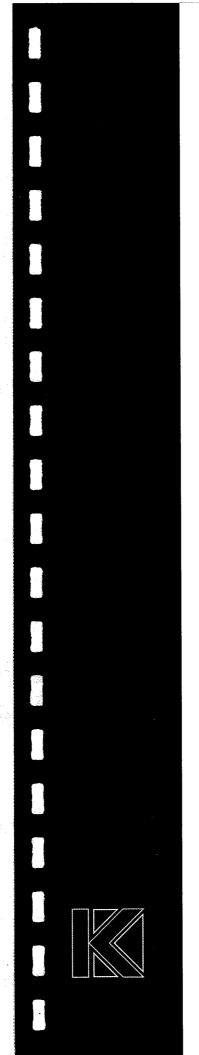
- Under forecast year 2006 total traffic conditions (with the proposed retail development), all of the study intersections are forecast to function within acceptable operating standards during the weekday a.m., p.m., and Saturday mid-day peak hours, with the exception of the North Adair Street/North Yew Street intersection. The southbound approach to this intersection is forecast to operate over capacity during the weekday p.m. peak hour and the intersection is not forecast to meet traffic signal warrants.
- A queuing analysis determined that with proposed off-site transportation improvements in place, sufficient lane storage will exist at the study intersections in the immediate site vicinity on North 4th Avenue, North Adair Street, and West Baseline Street.
- Right-turn deceleration lane warrants will be satisfied at the proposed right-in/right-out driveway on North Adair Street (OR 8) under the weekday p.m. and Saturday mid-day peak hours.
- Although ODOT left-turn lane warrant criteria will be satisfied along North 4th Avenue at the southern site-access driveway, the traffic operations and vehicle queuing analysis results indicate there is no need for a left-turn lane.
- Without the proposed right-in/right-out site-access driveway to North Adair Street, the levelof-service and volume-to-capacity ratio will degrade at the upstream intersection at North Adair Street and North 4th Avenue, relative to conditions where the proposed site-access driveway is in place along North Adair Street.
- Based on the proposed access spacing for the right-in/right-out driveway to North Adair Street (OR 8), a major deviation process through ODOT will be necessary to secure an access permit.

RECOMMENDATIONS

- Widen North 4th Avenue to a four-lane cross-section between the North Adair Street and West Baseline Street (OR 8) couplet to accommodate side-by-side left turn lanes northbound and southbound.
- Construct a right-turn deceleration lane on North Adair Street (OR 8) at the proposed rightin/right-out site driveway. Proper design treatment would consist of 20 feet of pavement

width to accommodate a 5-foot bicycle lane and a 15-foot right-turn deceleration lane. This would be separate from the pavement width that currently defines the two 12-foot westbound through travel lanes on the highway. The lane could be developed starting at the existing bus pullout located on the north side of North Adair Street (OR 8) and extended to the driveway location. Additionally, a bulb-out should be provided on the west corner of the driveway to force right-turning traffic exiting from the driveway to access the outside westbound through travel lane, while providing enough pavement width for a 5-foot bicycle lane.

- Construct a separate southbound right-turn lane with approximately 50 feet of striped storage at the North 4th Avenue/North Adair Street (OR 8) intersection in conjunction with site build-
- Landscaping along the site frontage of North Adair Street (OR 8) and North 4th Avenue should be maintained to ensure adequate sight distance at all site-access driveways.



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Section 2

Introduction

Introduction

PROJECT DESCRIPTION

PACLAND is proposing to develop a retail center in the northwest quadrant of the North Adair Street (OR 8)/North 4th Avenue intersection in Cornelius, Oregon. The site, whose location is illustrated in Figure 1, is primarily vacant. There are several homes on the east side of the property bordering North 4th Avenue. These homes will be removed prior to the start of construction. Full build out of the proposed retail development is scheduled for the year 2006. Figure 2 illustrates the proposed site plan.

SCOPE OF THE REPORT

The analysis contained in this report identifies the transportation-related impacts associated with the proposed development application and was prepared in accordance with City of Cornelius and Oregon Department of Transportation (ODOT) requirements. The study intersections and overall study area for this project are shown in Figure 1 and were selected based on a review of the local transportation system, ODOT Divison 51 criteria, and direction provided by City of Cornelius and ODOT Staff in a series of scoping letters, which are provided in Appendix A. Operational analyses were performed at the following study intersections:

- Pacific Avenue (OR 8)/Quince Street (OR 47);
- Pacific Avenue (OR 8)/Mountain View Lane;
- North Adair Street (OR 8)/North Yew Street;
- West Baseline Street (OR 8)/North Yew Street:
- North Adair Street (OR 8)/North 4th Avenue;
- West Baseline Street (OR 8)/South 4th Avenue;
- North Holladay Street/North 10th Avenue;
- North Adair Street (OR 8)/North 10th Avenue;
- West Baseline Street (OR 8)/South 10th Avenue;
- South 4th Avenue/Heather Street; and,
- South 10th Avenue/Dogwood Street.

This report addresses the following transportation issues:

- Existing land use and transportation system conditions within the site vicinity;
- Existing traffic safety;
- Planned developments and transportation improvements in the study area;
- Forecast year 2006 background traffic conditions during the weekday a.m., weekday p.m., and Saturday mid-day peak periods;
- Trip generation and distribution estimates for the proposed development;
- Forecast year 2006 total traffic conditions with full build-out of the site during the weekday a.m., p.m. and Saturday mid-day peak periods;
- A review of on-site traffic operations and circulation, vehicle queuing, and turn lanes needs;
- A review of Division 51 Deviation Permitting Process; and,
- Conclusions and recommendations.

It should be emphasized that this study was prepared to address the transportation impacts of the proposed development application, assuming the entire site property has been rezoned to C-2 Highway Commercial. As stated previously, a report has been prepared under separate cover to demonstrate that the proposed new plan designation can comply with the Transportation Planning Rule (Reference 1).

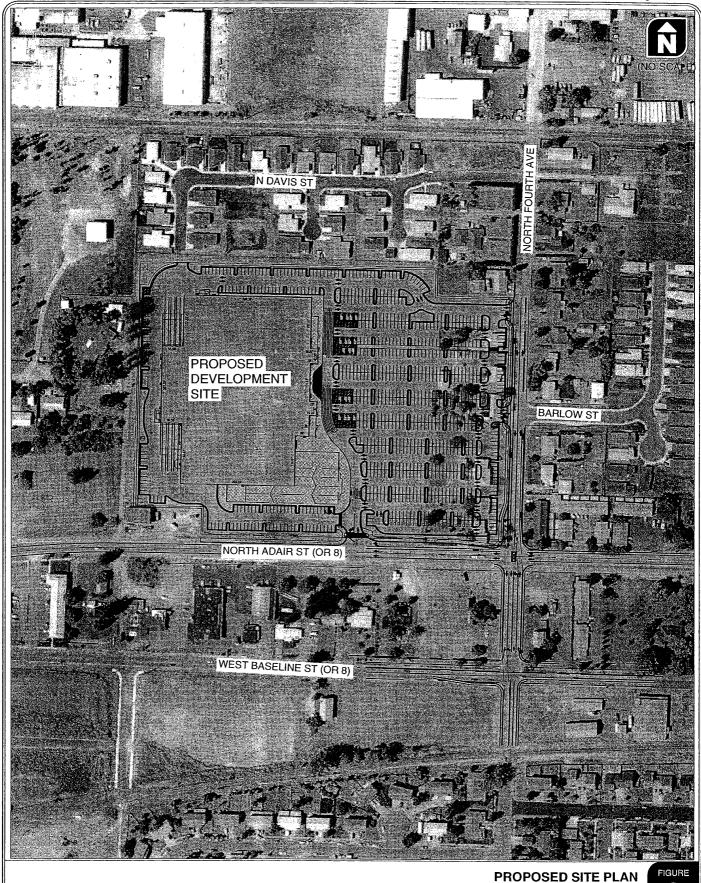


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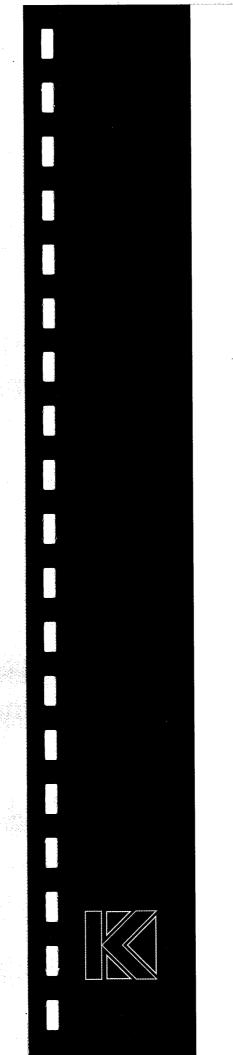
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Section 3

Existing Conditions

Existing Conditions

The existing conditions analysis identifies site conditions and the current operational and geometric characteristics of roadways within the study area. The purpose of this section is to set the stage for a basis of comparison to future conditions.

The site of the proposed development was visited and inventoried in April 2005. At that time. information was collected regarding site conditions, adjacent land uses, existing traffic volumes, operations, and transportation facilities in the study area.

SITE CONDITIONS AND ADJACENT LAND USES

The proposed development site is primarily vacant and is currently zoned C-2 Highway Commercial (13.25 acres) and A-2 Multi-Family Residential (2.67 acres). The site is bordered to the north by residential homes along North Davis Street, to the west by commercial and industrial properties, to the east by residences along North 4th Avenue, and to the south by a mixture of homes businesses along North Adair Street (OR 8).

TRANSPORTATION FACILITIES

Roadway Facilities

As indicated in Figure 1, primary access to the site will be provided via one right-in/right-out site access driveway onto the site frontage of North Adair Street (OR 8) and two driveways along the site frontage of North 4th Avenue. The southern driveway on North 4th Avenue will align directly across from North Barlow Street to the east.

North Adair Street (westbound) is a part of the OR 8 one-way couplet formed with West Baseline Street (eastbound). North Adair Street and West Baseline Street are both two-lane highway facilities with a posted speed limit of 30 to 40 miles-per-hour in the site vicinity. They are operated and maintained by the Oregon Department of Transportation (ODOT). Further west, North Adair Street and West Baseline Street combine into a single five-lane facility along Pacific Avenue.

North 4th Avenue is classified as a *Major Collector* and is under the jurisdiction of the City of Cornelius. In the vicinity of the site, North 4th Avenue has one travel lane in each direction. The posted speed limit is 25 miles-per-hour.

Table 1 provides a more detailed summary of the existing conditions along the roadway facilities evaluated in this study and Figure 3 identifies the existing lane configurations and traffic control devices at all identified study intersections.

Pedestrian and Bicycle Facilities

No sidewalk currently exists past the existing TriMet bus pullout on the north side of North Adair Street along the site frontage, though a westbound bicycle lane is provided in the vicinity of the site. No sidewalks or bike lanes are provided along the site frontage of North 4th Avenue and bicycle and pedestrian activity along the streets surrounding the site were observed to be low.

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Existing Transportation Facilities and Roadway Designations

Roadway	Classification	Cross Section	Speed Limit	Side- walks	Bicycle Lanes	On-Street Parking
North Adair Street (OR 8 - Westbound)	Statewide Highway (ODOT)	2-lane	30/40 mph	Yes ¹	Yes	No
West Baseline Street (OR 8 - Eastbound)	Statewide Highway (ODOT)	2-lane	30/40 mph	Yes²	Yes	No
Quince Street (OR 47)	Statewide Highway (ODOT)	3-lane	40 mph	Yes	Yes	No
Pacific Avenue (OR 8)	Statewide Highway (ODOT)	5-lane	40 mph	Partial	Yes	No
Mountain View Lane	Local Street (City of Forest Grove)	2-lane	25 mph	Yes	Yes	No
North Yew Street	Local Street (City of Forest Grove)	2-lane	N.P.	Partial	No	No
4 th Avenue	Major Collector (City of Cornelius)	2-lane	25 mph	Yes	No	No
10 th Avenue	Major Collector (City of Cornelius)	2-lane	25 mph	Yes³	No	Yes⁴
North Holladay Street	Local Street (City of Cornelius)	2-lane	N.P.	Partial	No	No
Heather Street	Local Street (City of Cornelius)	2-lane	25 mph	Partial	No	Partial
Dogwood Street	Local Street (City of Cornelius)	2-lane	25 mph	Partial	No	Partial

¹ A continuous sidewalk is provided on the north side of North Adair Street, east of 4th Avenue. A sidewalk is also located in the vicinity of the bus pullout along the site frontage.

Transit Facilities

Tri-Met bus service is currently provided along the site frontages of North Adair Street (Reference 2). In the general site vicinity, Route 57: TV Hwy/Forest Grove, provides service between Forest Grove and the Beaverton Transit Center, travels westbound along North Adair Street and eastbound along West Baseline Street in the vicinity of the site. Service is provided at approximately 15-minute headways every day of the week.

TRAFFIC VOLUMES AND PEAK HOUR OPERATIONS

Manual turning movement counts were obtained at the study intersections in the vicinity of the site on a mid-week day and Saturday in April and August 2005. All traffic counts were conducted during the weekday morning (7:00 a.m. - 9:00 a.m.), weekday evening (4:00 p.m. - 6:00 p.m.) and Saturday midday (11:00 a.m. - 1:00 p.m.) peak periods. The turning movement counts from the weekday a.m., p.m., and Saturday mid-day peak hours were summarized and rounded to the nearest five vehicles per hour as shown in Figures 4, 5, and 6. The weekday morning peak hour for the entire study area was found to occur between 7:15 and 8:15 a.m., the weekday evening peak hour between 4:30 and 5:30 p.m., and the Saturday mid-day peak hour between 12:00 and 1:00 p.m. No seasonal adjustment factor was applied to the existing base counts, as the area is urban in nature, and historical counts collected by ODOT in the vicinity of the site on North Adair Street and West Baseline Street show no significant seasonal peak characteristics. Appendix "B" contains the traffic count sheets used in this study.

² A continuous sidewalk is provided on the south side of West Baseline Street, east of 4th Avenue.

³ Sidewalks are provided intermittently along North 10th Avenue, primarily along the west side of the street.

⁴ Parking is allowed immediately north of North Adair Street on both sides of North 10th Avenue.

Current Levels of Service

All level-of-service analyses described in this report were performed in accordance with the procedures stated in the 2000 Highway Capacity Manual (Reference 3). A description of level of service and the criteria by which they are determined is presented in Appendix "C." Appendix "C" also indicates how level of service is measured and what is generally considered the acceptable range of level of service.

The North Adair Street-West Baseline Street couplet and Pacific Avenue are part of Oregon Highway 8 (OR 8) which is classified as a Statewide Highway by ODOT. The Highway Mobility Standards presented in the 1999 Oregon Highway Plan (Reference 4) state that a volume-to-capacity (v/c) ratio of 0.99 or less must be maintained at all intersections located on Statewide Highways for the highest two consecutive hours of weekday traffic volumes. This policy applies to all study intersections along Pacific Avenue, North Adair Street and West Baseline Street, as well as the proposed site-access driveway along North Adair Street. There is an exception to this standard for the two study intersections located at North 10th Avenue/North Adair Street and North 10th Avenue/West Baseline Street. Recently, a land use regulation was passed to designate the area east of North 10th Avenue as a Special Transportation Area, which now engenders a mobility standard of a v/c ratio of 1.10 or less for the first peak hour and a v/c ratio of 0.99 or less for the second peak hour.

The remaining study intersections along North 4th Avenue, Holladay Street, Heather Street, and Dogwood Street are in the city limits of Cornelius and under the jurisdiction of the City. The City of Cornelius's development review policy supports a LOS "E" or better standard for signalized intersections and LOS "E" or better for unsignalized intersections.

To ensure that this analysis was based on a reasonable worst-case scenario, the peak 15-minute flow rates during the weekday a.m., p.m., and Saturday mid-day peak hours were used in the evaluation of all intersection levels of service and volume-to-capacity ratios. For this reason, the analyses reflect conditions that are only likely to occur for 15 minutes out of each average peak hour. Traffic conditions during all other weekday hours will likely operate under better conditions than those described in this report.

Using the weekday a.m., weekday p.m., and Saturday mid-day peak hour traffic volumes, volume-tocapacity ratios and levels of service were calculated for all the study intersections as shown in Figures 4, 5, and 6. As indicated in the figures, all but one of the study intersections are shown to operate at acceptable levels of service during these time periods. The southbound minor street approach at the North Adair Street/Yew Street intersection is currently functioning at LOS F with a v/c ratio at 1.0 during the weekday p.m. peak hour. An analysis of signal warrants for this intersection, using ODOT methodologies, indicates a traffic signal is not warranted at this time. Appendix "D" includes the existing conditions level-of-service worksheets and the results of the signal warrants analysis.

Traffic Safety

The crash histories of study intersections in the vicinity of the site were reviewed in an effort to identify potential intersection safety issues. Crash records were obtained from ODOT for the most recent fiveyear period from January 1, 1999 through December 31, 2003. All crash data including the calculations for crash rates are provided in Appendix "E" of this report. A summary of the crash data is provided in the following paragraphs.

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LEGEND

CM = CRITICAL MOVEMENT (UNSIGNALIZED)
LOS = INTERSECTION | EVEL OF SERVICE

LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED) Del = INTERSECTION AVERAGE CONTROL DELAY

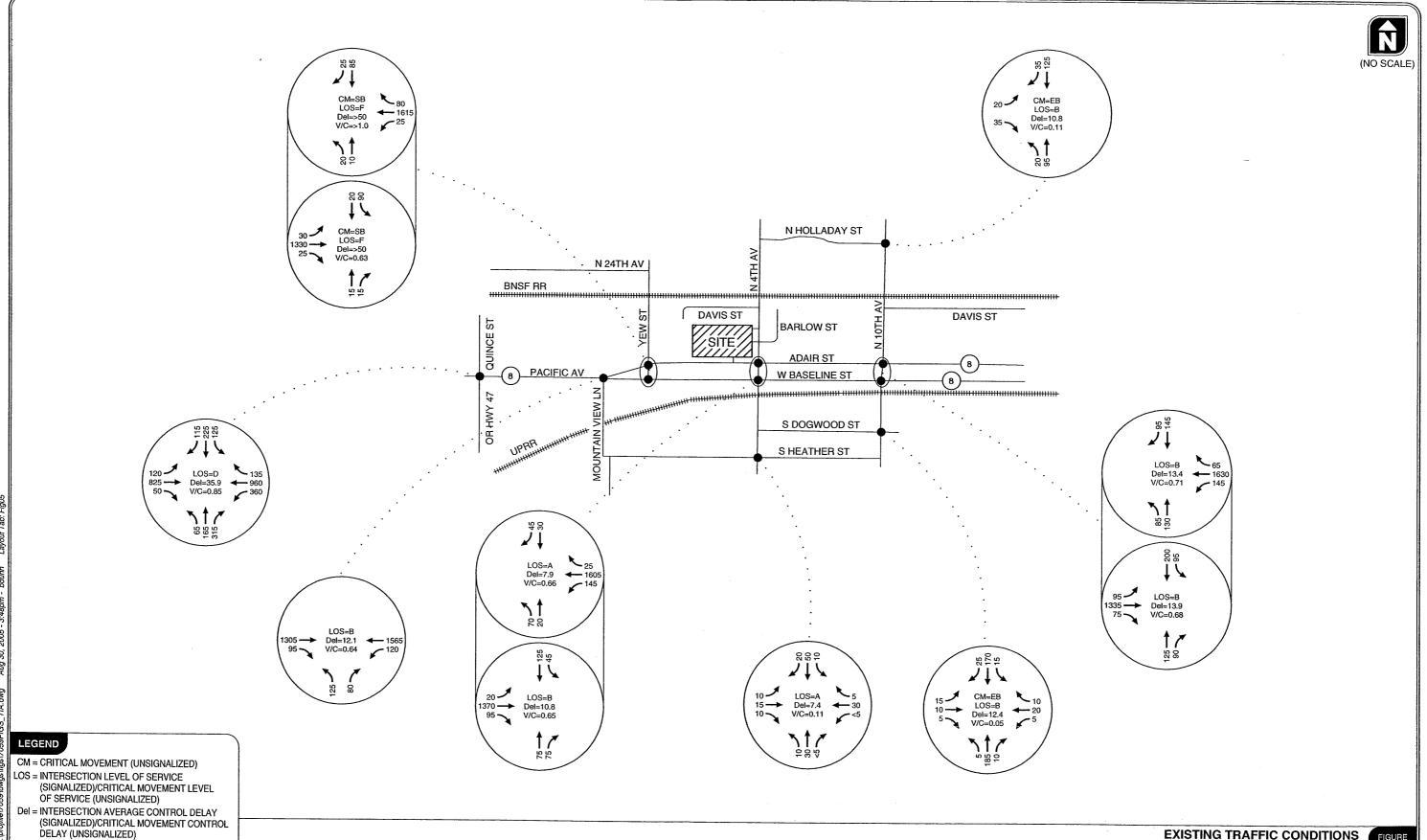
(SIGNALIZED)/CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)

V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

EXISTING TRAFFIC CONDITIONS
WEEKDAY AM PEAK HOUR
CORNELIUS, OREGON

FIGUR







V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

EXISTING TRAFFIC CONDITIONS WEEKDAY PM PEAK HOUR CORNELIUS, OREGON

FIGUR

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TRANSPORTATION PLANNING / TRAFFIC ENGINEERING

DELAY (UNSIGNALIZED)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/CRITICAL MOVEMENT CONTROL

EXISTING TRAFFIC CONDITIONS SATURDAY MIDDAY PEAK HOUR CORNELIUS, OREGON

FIGUI

Crash rates of intersections are often expressed in crashes per million entering vehicles (MEV) for evaluation purposes. These calculations are presented in Table 2 and show that the North Adair Street/North 4th Avenue intersection has a relatively high crash rate in comparison to the other study intersections. Base on these rates, the patterns amongst the crashes were evaluated to determine if there are any operational or geometric deficiencies that are potentially contributing to the crash patterns.

Table 2 **Crash Analysis Results** (1/1/99 through 12/31/03)

				Туре			Severity	O		
Intersection	Total Crashes	Rear- End	Turn	Angle	Back	Other	PDO	lnj.	Fat.	Crash Rate (Acc/MEV)
Pacific Avenue / Mountain View Lane	18	14	4	0	0	0	8	10	0	0.30
North Adair Street / North 4 th Avenue	29	1	6	21	0	1	11	18	0	0.82
West Baseline Street / South 4 th Avenue	21	2	4	15	0	0	9	11	0	0.64
North Adair Street / North 10 th Avenue	29	5	9	14	0	1	16	13	0	0.69
West Baseline Street / South 10 th Avenue	8	2	2	4	0	o	3	5	0	0.22
North Holladay Street / North 10 th Avenue	0	0	0	0	0	О	0	0	0	0.00

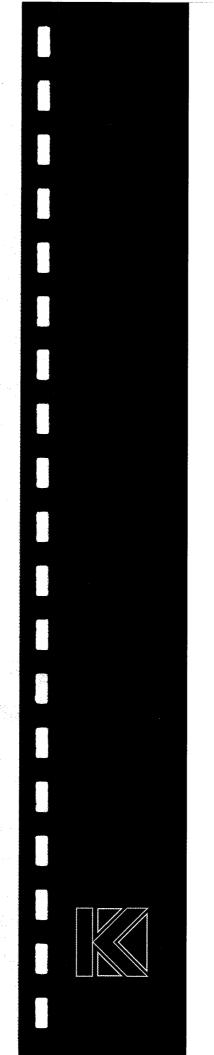
Note: Fat. = Fatalities, Inj. = Injuries, PDO = Property Damage Only

Acc/MEV = Accidents per million entering vehicles

At the North Adair Street/North 4th Avenue intersection, there have been a disproportionately high number of turning/angle crashes reported in the most recent five years of data. A close inspection of the collisions revealed that the majority of the turning and angle crashes occurred when northbound leftturning drivers on North 4th Avenue attempted to turn left during the red signal phase, which is allowed by Oregon law when drivers approach an intersecting one-way street with traffic flowing to the left. These types of crashes are likely due to the heavy traffic flows on the east-west mainline and northbound left-turning drivers misjudging appropriate gaps to turn into the traffic stream at the signal. Adequate sight distance exists for drivers at this location, and no specific geometric deficiency is apparent. Given a lack of any obvious geometric or sight distance deficiency, no short-term safety improvements are recommended at this intersection, save for posting a "No Left-Turn on Red" sign.

Although the historical crash rate is not relatively high for the West Baseline Street/South 4th Avenue intersection, there have been a disproportionately high number of angle-type accidents. A review of the accident records shows that most of these crashes occurred when drivers traveling straight through the intersection on the northbound or southbound approaches disregarded the traffic signal control and hit an eastbound vehicle traveling straight through the intersection. A potential measure to improve safety at this intersection would be to increase the vehicle clearance time between signal phases to better clear vehicles between signal phases. The same angle-type accident pattern has also occurred at the other study intersection located at North Adair Street and North 10th Avenue, where an increase in the clearance time may improve driver safety.

Based on the safety findings, it is recommended that ODOT study the above three study intersections to further investigate measures to reduce the number of angle-type collisions.



Section 4

Transportation Impact Analysis

Transportation Impact Analysis

The transportation impact analysis identifies how the study area's transportation system will operate in the year that the proposed development will be fully built-out and occupied. The impact of traffic generated by the proposed retail development during typical weekday a.m., weekday p.m., and Saturday mid-day peak hours was examined as follows:

- Planned developments and transportation improvements in the site vicinity were identified and reviewed;
- Background weekday a.m., weekday p.m., and Saturday mid-day peak hour traffic conditions for the year 2006 were analyzed. A one-year growth rate of 1.0 percent was applied to existing traffic volumes to account for regional growth in the site vicinity. accounting was made of traffic from five in-process developments in the site vicinity;
- Future daily, weekday a.m., weekday p.m., and Saturday mid-day peak hour site-generated trips were estimated for build-out of the site;
- A trip distribution pattern was derived through a review of existing traffic volumes, local transportation facilities, the location of other similar retail establishments, and a select zone analysis obtained from Washington County using the regional traffic model;
- Predicted site-generated traffic from the development was added to the background traffic volumes to evaluate year 2006 total traffic operations at the study area intersections during the weekday a.m., weekday p.m., and Saturday mid-day peak hours;
- An analysis of turn lane requirements and vehicle queuing was conducted;
- On-site circulation and safety for pedestrians, passenger cars, and delivery trucks was evaluated: and.
- Appropriate future mitigations were identified.

Planned Developments and Transportation Improvements

As part of this analysis, Kittelson & Associates, Inc. identified and reviewed planned developments and transportation improvements within the site vicinity. Based on conversations with staff from the City of Cornelius and ODOT, the following five in-process developments were identified:

- Walgreens Pharmacy (North Adair St/19th Ave);
- Hobbs Farm Estates (North Holladay St/19th Ave);
- Natures Ridge (North Holladay/19th Ave):
- Davis Street Apartment Complex (North Adair St between 12th Ave& 13th Ave); and
- Residential Development (North Adair St/8th Ave).

There are no planned transportation improvements in the vicinity of the site in the immediate future that would significantly alter existing travel patterns.

2006 BACKGROUND TRAFFIC CONDITIONS

The background traffic analysis identifies how the study area's transportation system will operate when the proposed retail development is expected to open in the year 2006. This analysis includes traffic growth due to general growth in the region and traffic from identified in-process developments, but does not include traffic from the proposed development.

Traffic Volumes

Year 2006 background traffic volumes were developed by applying a one-year growth rate of 1.0 percent to existing traffic volumes to account for regional traffic growth over the next year. This growth rate was calculated from historical traffic counts conducted by ODOT near the proposed development site on North Adair Street and West Baseline Street over the ten-year period between 1994 and 2003. Appendix "F" contains the growth rate calculation worksheet. The background traffic volume estimates also account for the increased traffic from identified in-process developments in the site vicinity. Figures 7, 8, and 9 illustrate the resulting forecast year 2006 background traffic volumes.

Level-of-Service Analysis

Using the weekday a.m., weekday p.m., and Saturday mid-day peak hour turning movement volumes shown in Figures 7, 8, and 9, an operational analysis was conducted at each study intersection to determine the 2006 background traffic conditions. Figures 7, 8, and 9 also present the analysis results for the weekday a.m., weekday p.m., and Saturday mid-day peak hours, respectively. As shown, all but one of the study intersections are forecast to operate with acceptable levels of service and volume-tocapacity ratios during all study time periods. As in the Existing Conditions section of this study, the intersection of North Adair Street and North Yew Street will continue to function at LOS F with a v/c ratio at or greater than 1.0 during the weekday p.m. peak hour. An analysis of signal warrants for this intersection, using ODOT methodologies, indicates a traffic signal will not be warranted. Appendix "G" contains the year 2006 background level-of-service worksheets and signal warrant worksheet.

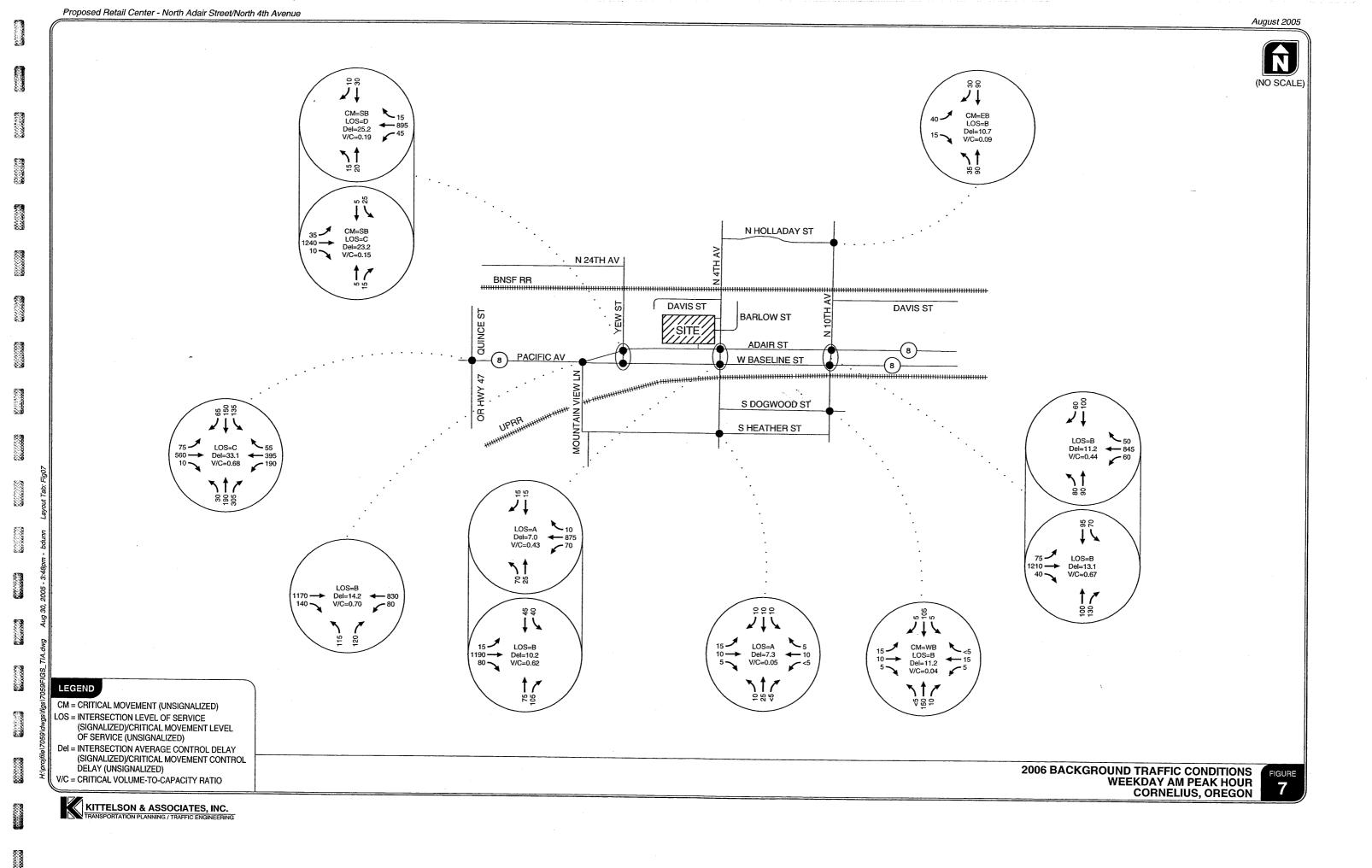
PROPOSED DEVELOPMENT PLAN

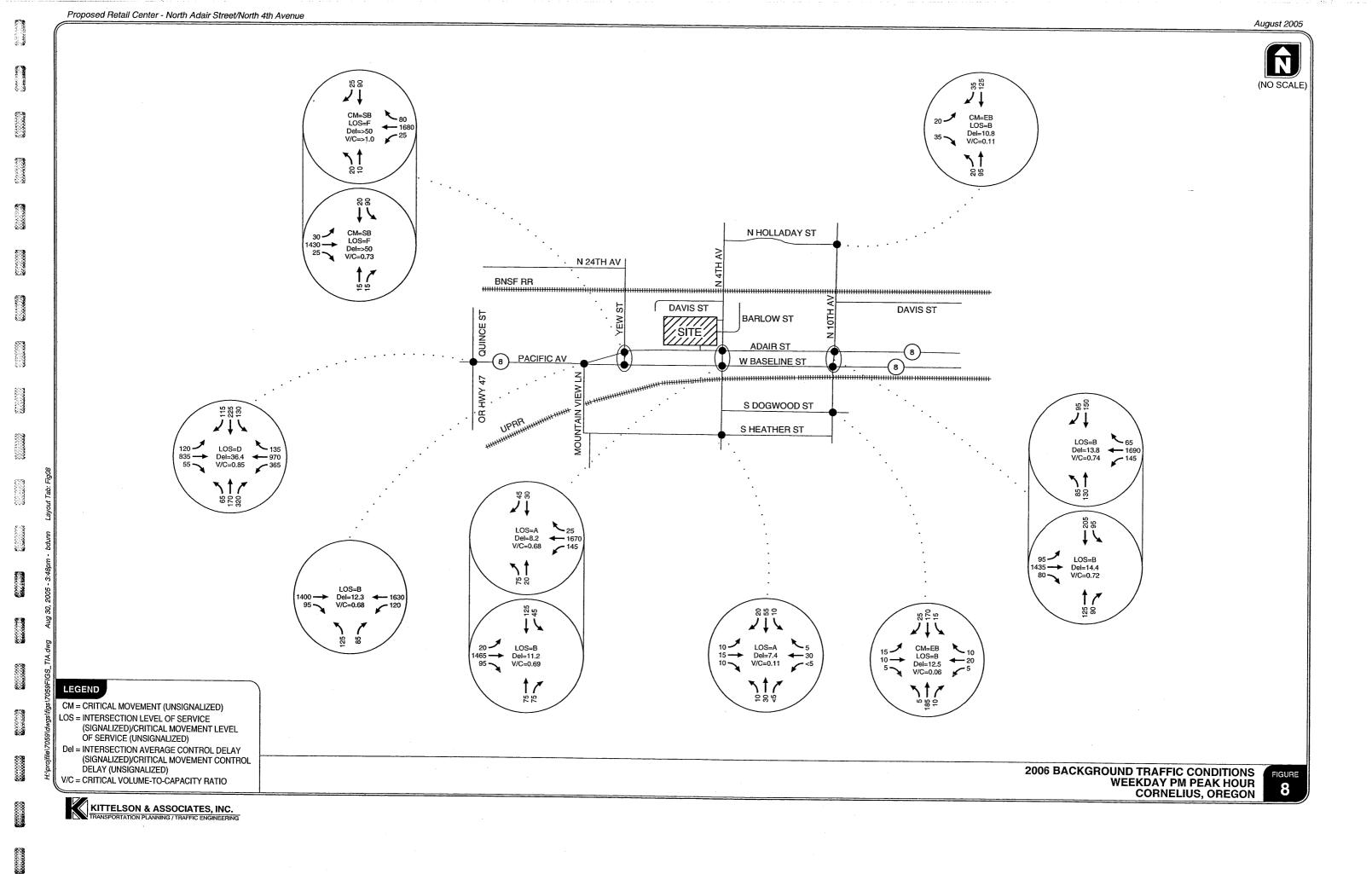
PACLAND proposes to construct a retail center in the northwest quadrant of the North Adair Street (OR 8)/North 4th Avenue intersection. The site is proposed to have three external site-access driveways: one unsignalized right-in/right-out driveway to North Adair Street, and two unsignalized full access driveways on North 4th Avenue.

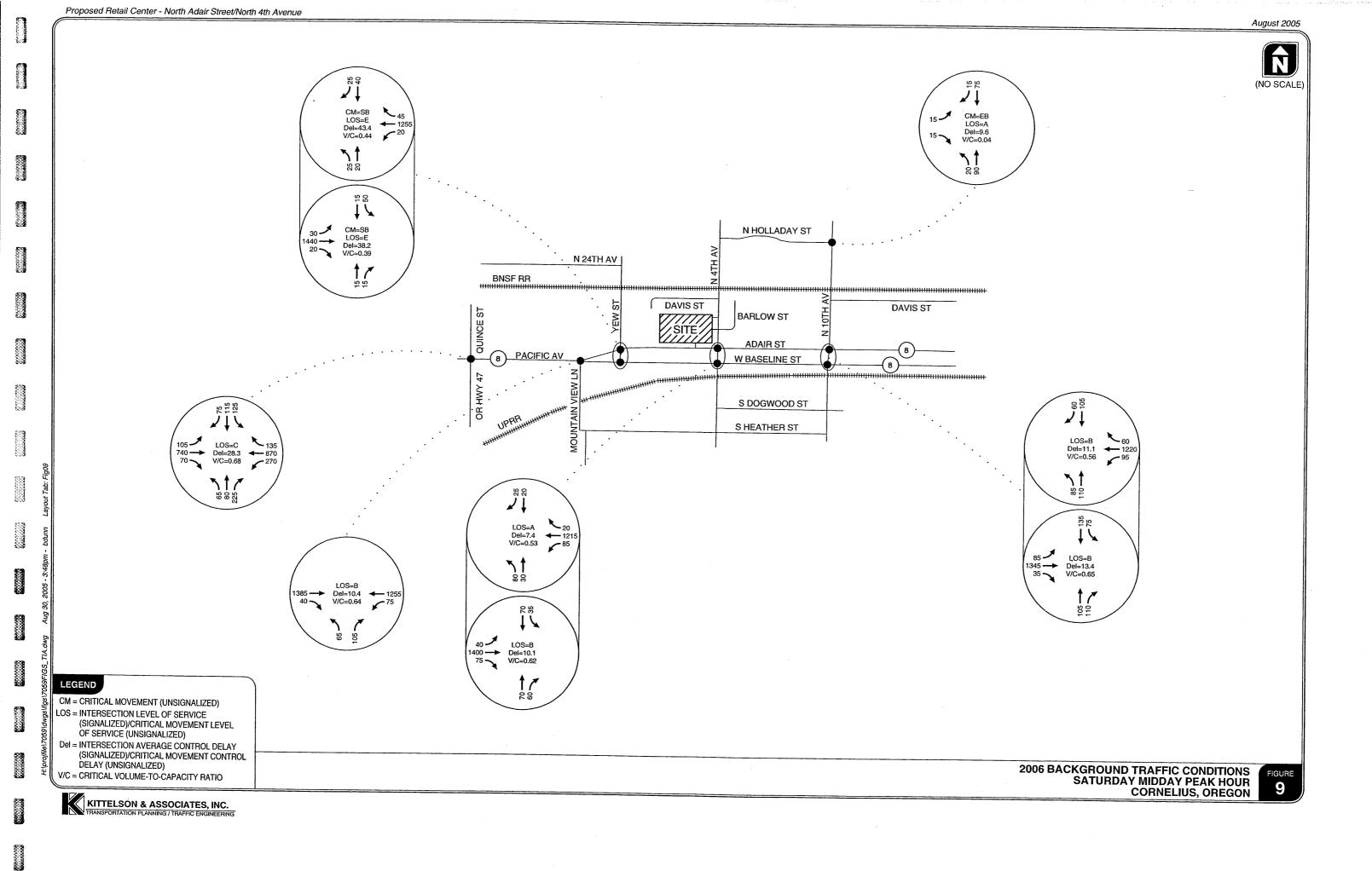
Assumed lane configurations and traffic control devices for the study intersections including the proposed site access driveways are shown in Figure 10. It should be emphasized the current development proposal shows North 4th Avenue widened to a four-lane cross section between the OR 8 couplet of North Adair Street and West Baseline Street in conjunction with site build out. Sufficient right-of way exists between the east-west couplet streets to provide side-by-side northbound and southbound left-turn lanes to accommodate the anticipated left-turning queues at these two locations, as well as to the north and south of the couplet for an adequate transition taper. The proposed site plan proposal also includes a right-turn deceleration lane into the site access driveway to North Adair Street, and a right-turn lane on the southbound approach to the North Adair Street/North 4th Avenue intersection.

TRIP GENERATION

Estimates of daily, weekday a.m., weekday p.m., and Saturday mid-day peak hour vehicle trip ends for the proposed retail center were developed based on empirical observations at similar developments. These observations are summarized in the standard reference Trip Generation, 7th Edition, published by the Institute of Transportation Engineers (Reference 5), for a Shopping Center land use. In addition, pass-by trip data for similar retail developments was obtained from the Institute of Transportation Engineers' Trip Generation Handbook (Reference 6). Based on the ITE data, a 34 percent pass-by trip reduction for the weekday and 26 percent for Saturday was used in this analysis. Table 3 summarizes the estimated site trip generation during a typical weekday as well as during the weekday p.m. and Saturday mid-day peak hours (all trip ends shown in Table 3 have been rounded to the nearest five trips).







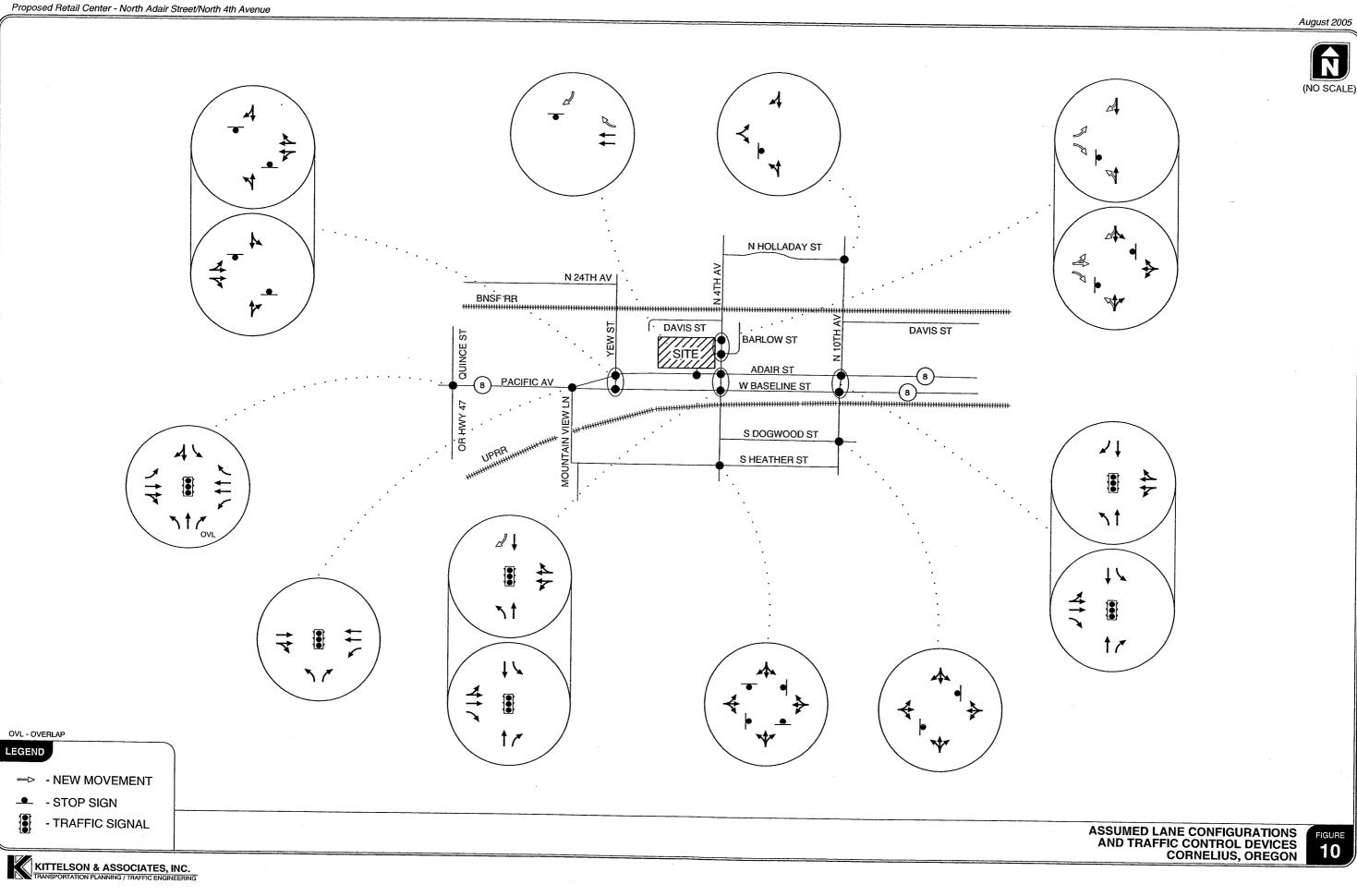


Table 3										
Estimated	Site	Trip	Generation							

Land Use	ITE Size		Daily	Weekday AM Peak Hour Trips		Weekday PM Peak Hour Trips			Saturday Mid-Day Peak Hour Trips			
		(sq. ft.)	Trips	Total	ln	Out	Total	In	Out	Total	In	Out
Shopping Center	820	179,902	9,950	220	135	85	920	440	480	1,270	660	610
Pass-by trip reduction (34% Daily/AM/PM 26% Sat)	4.00		(3,380)	(80)	(40)	(40)	(320)	(160)	(160)	(330)	(165)	(165)
Net New Trips		6,570	140	95	45	600	280	320	940	495	445	

As shown in Table 3, the proposed development is expected to generate approximately 9,950 total daily trips of which approximately 220 total trips will occur during the weekday a.m. peak hour, 920 during the weekday p.m. peak hour, and 1,270 total trips will occur during the Saturday mid-day peak hour. Assuming a pass-by trip reduction factor of 34 percent for daily, weekday a.m., and weekday p.m., and 26 percent pass-by factor on Saturday, the site is estimated to generate approximately 6,570 net new trips on an average weekday, of which approximately 140 net new trips are estimated to occur during the weekday a.m. peak hour, with 600 net new trips occurring during the weekday p.m. peak hour, and 940 net new trips occurring during the Saturday mid-day peak hour.

It should be emphasized that although the overall size of the retail center, by City definition, is greater than 200,000 square feet, only 179,902 square feet was used as the basis for the site trip generation. This is because the relative difference in square footage applies to the "open air" garden area located outside the main confines of the building structure. The ITE trip generation rates for a Shopping Center land use do not apply to areas outside the primary walls of the structure.

TRIP DISTRIBUTION

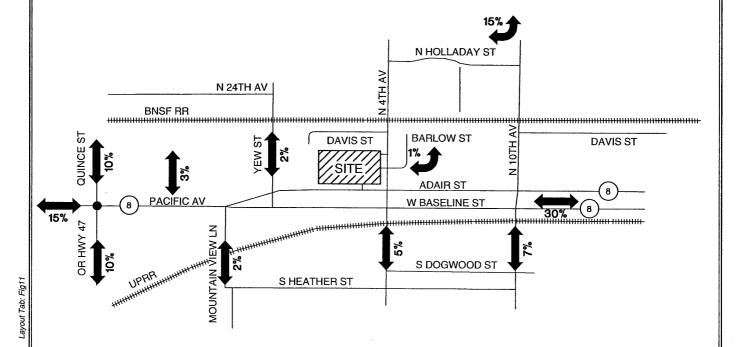
The distribution of site-generated trips onto the study area roadway system was estimated based on a review of existing turning movement patterns observed from the traffic counts conducted in the vicinity of the site, a review of the local transportation street network, the location of other similar retail establishments, and a review of a select zone assignment provided by Washington County using the regional travel demand forecasting model. The estimated trip distribution for all study periods is illustrated in Figure 11.

As shown in Figure 11, the majority of the site-generated traffic is estimated to travel to and from North Adair Street and West Baseline Street (35% west, 30% east). The bulk of the remaining site trips are estimated to travel north and south along Mountain View Drive, 4th Avenue, and 10th Avenue. Based on the estimated trip distribution pattern shown in Figure 11 and the trip generation shown in Table 3, Figures 12, 13, and 14 show the assignment of the site-generated traffic during the weekday a.m., weekday p.m., and Saturday mid-day peak hours, respectively.

2006 TOTAL TRAFFIC CONDITIONS

The total traffic conditions analysis forecasts how the study area's transportation system will operate with the inclusion of traffic from the proposed development. The 2006 background traffic volumes for the weekday a.m., weekday p.m., and Saturday mid-day peak hours shown in Figures 7, 8, and 9 were added to the site-generated traffic shown in Figures 12, 13, and 14, to arrive at the total traffic volumes shown in Figures 15, 16, and 17, respectively.





ESTIMATED TRIP DISTRIBUTION PATTERN (BUILD-OUT YEAR 2006) CORNELIUS, OREGON

FIGURE



2006 SITE-GENERATED TRAFFIC VOLUMES WEEKDAY AM PEAK HOUR CORNELIUS, OREGON

12

2006 SITE-GENERATED TRAFFIC VOLUMES WEEKDAY PM PEAK HOUR CORNELIUS, OREGON

13

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2006 SITE-GENERATED TRAFFIC VOLUMES SATURDAY MIDDAY PEAK HOUR CORNELIUS, OREGON

14

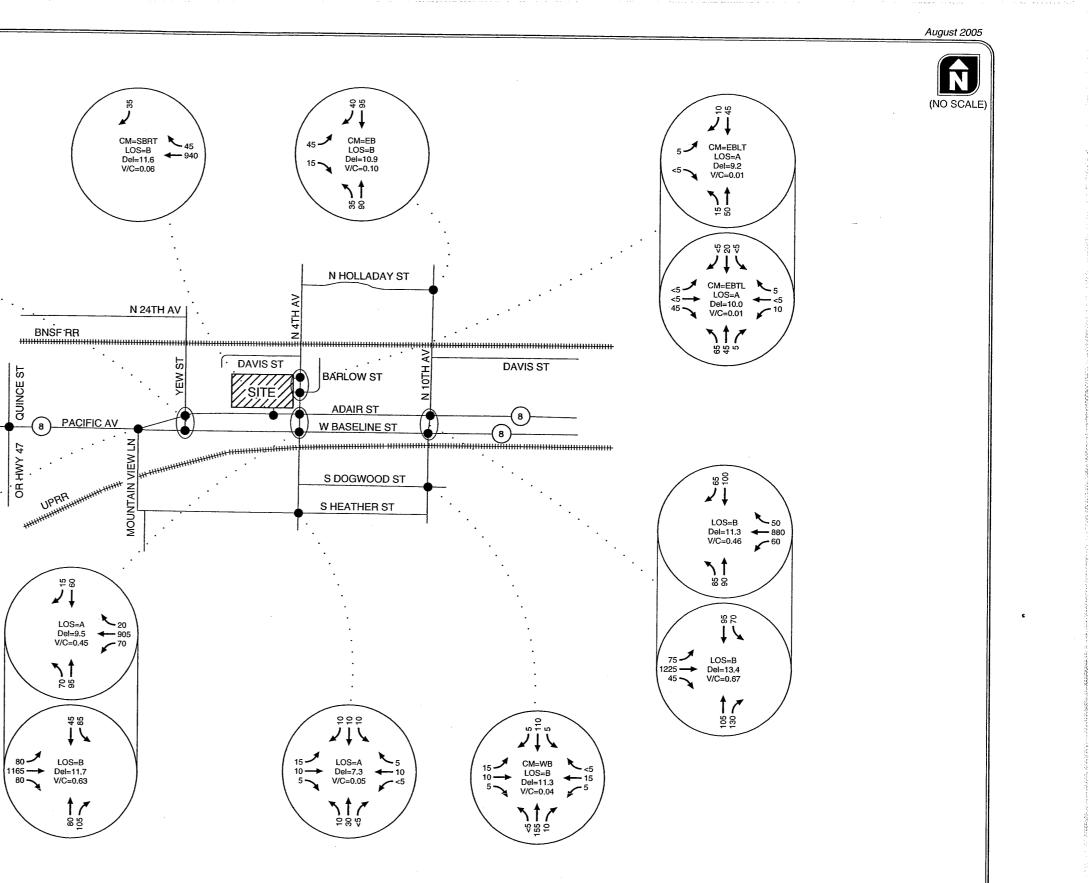
CM=SBTR

CM=SBTL 35 1280 LOS=C 10 Del=24.2 V/C=0.16

LOS=B
Del=14.5
V/C=0.72
80

75 LOS=C 575 Del=33.7 400 10 V/C=0.70 195

CM=SBTR LOS=D Del=26.5 V/C=0.21



LEGEND

CM = CRITICAL MOVEMENT (UNSIGNALIZED) LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)

Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)

V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

2006 TOTAL TRAFFIC CONDITIONS WEEKDAY AM PEAK HOUR CORNELIUS, OREGON

FIGURE 15

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION PLANNING / TRAFFIC ENGINEERING



2006 TOTAL TRAFFIC CONDITIONS WEEKDAY PM PEAK HOUR CORNELIUS, OREGON

LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)

Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)

V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

2006 TOTAL TRAFFIC CONDITIONS SATURDAY MIDDAY PEAK HOUR CORNELIUS, OREGON



Intersection Levels of Service

Figures 15, 16 and 17 also provide a summary of year 2006 operating conditions at the study intersections assuming full build-out of the proposed development. As indicated in the respective figures, with proposed off-site transportation improvements in place, all of the study intersections are shown to operate at levels which meet the level-of-service standards of the City of Cornelius and the v/c ratio mobility standard of ODOT during the weekday a.m., weekday p.m., and Saturday mid-day peak hours, with the exception of the North Adair Street/North Yew Street intersection. This intersection is forecast to continue operating at LOS F and a v/c ratio over 1.0 during the weekday p.m. peak hour. Additionally, a signal warrant analysis indicates a traffic signal will not be warranted at this intersection under total build-out conditions. Based on these findings, it is recommended that a traffic signal not be installed until warrants are met. Appendix "H" contains the 2006 total traffic level-of-service worksheets and signal warrant worksheet.

Queuing Analysis

A vehicle queuing analysis was conducted under forecast year 2006 total traffic conditions to determine the vehicle storage requirements for key intersections in the study area. In the analysis, a Poisson distribution was applied at a 95th-percentile confidence interval to determine vehicle queue length probabilities. In other words, vehicles were assumed to arrive randomly and the queues reported will not be exceeded for more than five percent of the peak hour. The assumed length-of-red interval for signalized intersections was taken from the signal timing parameters used in the LOS calculations. For unsignalized intersections, the vehicle queuing analysis assumes random arrivals. Estimates of 95thpercentile vehicle queues are based on equation 17-37 from the Highway Capacity Manual (Reference 3) and one vehicle was assumed to occupy 25 feet for this analysis. Table 4 summarizes the results of the intersection queuing analysis. Appendix "I" contains the queuing analysis worksheets.

As shown in Table 4, the queuing analysis determined that with proposed off-site transportation improvements in place, sufficient lane storage will exist at the study intersections of North Adair Street/North 4th Avenue and West Baseline Street/North 4th Avenue, as well as the proposed site-access driveways to North Adair Street and North 4th Avenue.

Table 4
95th-Percentile Vehicle Queuing Summary
(Year 2006 Total Traffic Conditions)

					· · · · · · · · · · · · · · · · · · ·	
Intersection	Movement & Approach	Weekday AM Peak Hour (ft)	Weekday PM Peak Hour (ft)	Saturday Mid-Day Peak (ft)	Available Storage (ft)	Adequate Storage Available?
	NB LT	75	75	100	250¹	Yes
North Adair Street (OR	NB TH	100	175	225	250	Yes
8) at North 4 th Avenue	SB TH	75	175	200	Cont.	Yes
	SB RT	25	50	50	65²	Yes
	NB TH	75	75	100	Cont.	Yes
West Baseline Street (OR 8) at North 4 th	NB RT	100	75	75	150	Yes
Avenue	SB LT	100	175	200	250¹	Yes
	SB TH	50	125	75	250	Yes
North Adair Street (OR 8) at Right-in/Right-out Driveway	SB RT	25	125	100	Cont.	Yes
North 4 th Avenue at	NB LT	25	25	25	Cont.	Yes
North Barlow Street/Site Driveway	EB LT	25	25	25	50	Yes
Driveway	EB RT	25	25	50	50	Yes
	NB LT	25	25	25	Cont.	Yes
North 4 th Avenue at Northern Site Driveway	EB LT	25	25	25	50	Yes
	EB RT	25	25	25	50	Yes

Cont. = Continuous travel lane.

Analysis of Alternative Access Scenario

This section of the report contains an analysis of an additional site access scenario for which no access would be provided to the site along North Adair Street. The analysis was performed only for the weekday p.m. peak hour, which is the critical time period for when total traffic volumes reach their highest levels. Again, this scenario restricts all access to North Adair Street, with all site access taken from the two proposed driveways on North 4th Avenue. This alternative scenario was analyzed to fulfill a request made by ODOT officials and to provide a comparison between the operational impacts of having one right-in/right-out site-access driveway to North Adair Street versus having none at all.

The results of the operational analysis for this scenario are shown in Table 5. Appendix "J" contains the operational analysis worksheets and queuing worksheets for this access scenario. As shown in Table 5, the signalized intersection at North Adair Street and North 4th Avenue is forecast to operate at LOS C with a volume-to-capacity ratio of 0.93 during the weekday p.m. peak hour with no site access provided to North Adair Street. This is an increase of 0.11 in volume-to-capacity ratio and a degradation of level-of-service when compared to the proposed access scenario.

¹ Available striped storage length based on proposed side-by-side left-turn lanes on North 4th Avenue between North Adair Street and West Baseline Street.

² Available storage with proposed southbound right-turn lane

Table 5
Operations Analysis Comparison for Scenario with No Access to North Adair Street
(Year 2006 Total Weekday P.M. Peak Hour)

Scenario	North /	Adair Street/North 4 th Avenue					
	LOS	V/C	Delay				
RIRO* Access to North Adair Street (Proposed)	В	0.82	18.2				
No Access to North Adair Street (Alternative Scenario)	С	0.93	23.3				

^{*} RIRO - Right-In/Right-Out Driveway

The results of this comparison show that the proposed right-in/right-out driveway to North Adair Street provides better circulation of traffic and operations at the upstream North Adair Street/North 4th Avenue intersection. Additionally, the proposed right-in/right-out driveway is to act as one of the entry/exit points for truck deliveries. Without the driveway, it would be difficult for trucks destined for the northern truck bay and those trucks departing the southern truck bay to access North Adair Street. Furthermore, the resulting southbound right-turn queues would extend 200 feet, exceeding the available 50 feet of striped storage for the proposed southbound right-turn lane. These queues coupled with vehicles wishing to travel south through the intersection could potentially interfere with the southern site driveway and North Barlow Street intersection.

RIGHT TURN DECELERATION LANE WARRANT ANALYSIS

An analysis was conducted to determine the need for the proposed right-turn deceleration lane at the right-in/right-out driveway entrance along North Adair Street. This analysis was conducted in accordance with the guidelines for Right Turn Lane Criteria by ODOT. The analysis is based on comparing the right turn volume at a given location to the approach volume (adjacent through volumes plus right turn) to determine the degree to which the right turns may impede through vehicles. The analysis was conducted using the total traffic volume estimates for the weekday p.m. peak hour and the Saturday midday peak hour, which are the critical time periods when adjacent street traffic and site traffic peak. Table 6 summarizes the results of this analysis.

Table 6
Right-Turn Lane Warrant Analysis
(Year 2006 Total Traffic Conditions)

Intersection	Study Period	Movement	Through Volume ¹ (veh/hr)	Right Turn Volume (veh/hr)	Total Advancing Volume ¹ (veh/hr)	Right Turn Lane Warrant Met?
North Adair Street At Right-in/Right- out Driveway	PM Peak Hour	WB RT	850	185	1,035	Yes
North Adair Street At Right-in/Right- out Driveway	Saturday Mid-day Peak Hour	WB RT	625	240	865	Yes

Notes: WB = Westbound, RT = Right turn.

1 Volume in outside travel lane.

As shown in Table 6, the right-turn lane warrant is met at the site-access driveways along North Adair Street, based on year 2006 total traffic conditions during the weekday p.m. and Saturday midday peak hours. Appendix "K" contains the right turn deceleration lane warrant worksheets.

Based on the findings above, it is recommended that right-turn deceleration lane be installed as proposed at the right-in/right-out site-access driveway along North Adair Street. Proper design treatment would consist of 20 feet of pavement width to accommodate a 5-foot bicycle lane and a 15-foot right-turn deceleration lane. This would be separate from the pavement width that currently defines the two 12-foot westbound through travel lanes on the highway. The lane could be developed starting at the existing bus pullout located on the north side of North Adair Street and extended to the driveway location. Additionally, a bulb-out should be provided on the west corner of the driveway to force right-turning traffic from the driveway to access the outside westbound through travel lane, while providing enough pavement width for a 5-foot bicycle lane.

LEFT TURN LANE WARRANT ANALYSIS

An analysis was conducted to determine whether the impacts from the proposed retail development will generate the need for an exclusive left-turn lane along the site frontage of North 4th Avenue. This analysis was conducted using several criterion: 1) ODOT Left Turn Lane Criteria, 2) build-out year 2006 intersection operations, and 3) build-out year 2006 vehicle queuing estimates.

The analysis of left-turn lane warrants using the ODOT Left Turn Lane Criteria was based on comparing the left turn volume at each of the proposed site-access driveways to the opposing plus advancing volumes to determine the degree to which the left turns may impede through vehicles. Although the warrant analysis results appear to indicate that a left-turn lane will be warranted only at the south driveway along North 4th Avenue (located across from Barlow Court), based on year 2006 total traffic conditions during the weekday p.m. and Saturday midday peak hours, the applicability of the ODOT criteria is suspect. This is because North 4th Avenue is a *Collector* street and not a state highway for which the ODOT criteria is based. Additionally, the posted speed on North 4th Avenue is low at 25 mph, and the nomagraphs shown in the ODOT left-turn lane criteria table only identify a volume-based threshold of less than or equal to 35 mph, with no indication of what the exact threshold would be for a roadway with a posted speed of 25 mph. *Appendix "K" also contains the left turn lane warrant worksheets*.

To further analyze the need for a left-turn lane on North 4th Avenue, a review was made of the traffic operations and vehicle queue projections for the northbound approaches at each of the site-access driveways, under build-out year 2006 total traffic conditions. The operations analysis results indicates a single northbound travel lane on North 4th Avenue (where left-turn movements are shared with through movements) will function very well with a LOS A during all analysis periods and average vehicle delays below 8.0 seconds. The queuing estimates also show no more than one vehicle present in a queue, indicating that drivers proceeding northbound will not be adversely affected by left-turning vehicles.

Based on the operational and queuing analysis results and the questionable results of the ODOT left-turn lane warrant analysis, a center left-turn lane is not recommended for North 4th Avenue along the site frontage.

ON-SITE CIRCULATION

As part of this study, internal circulation was evaluated to ensure that the site provides sufficient on-site circulation for pedestrian and traffic movements. Kittelson & Associates, Inc. worked with the project's development team to enhance the operational and safety aspects of the proposed external site-access driveways, pedestrian access throughout the site, and detailed review of on-site truck circulation through

simulations using the turn movement patterns of a WB-67 truck. Through this analysis, the proposed site plan has been refined to meet the needs of both pedestrian and vehicular traffic (passenger cars and trucks). Appendix "L" contains turning movement diagrams illustrating the travel paths of large delivery trucks within the site.

SIGHT DISTANCE

Intersection sight distance was observed in the field at all study intersections. None of the study intersections observed in the field exhibited any sight distance deficiencies. Landscaping along the site frontage should be maintained to provide adequate site distance at the site driveways.

DIVISION 51 DEVIATION PROCESS

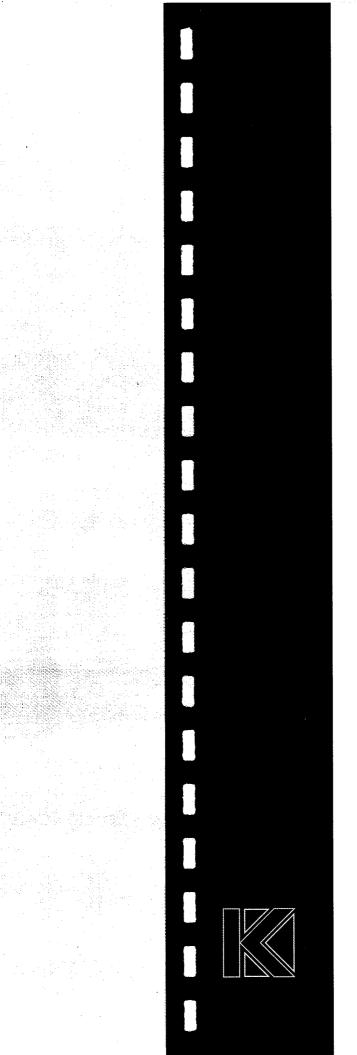
Throughout the proposed project limits, North Adair Street (OR 8) is classified as a *Statewide Highway* with a designation of "Urban Other," and has a posted speed of 40 mph. As such, the access spacing standard for this facility is 990 feet between driveways on the same side of the street. The minor deviation standard is 530 feet for driveways on the same side of the street.

A right-in/right-out site-access driveway is proposed on North Adair Street (OR 8). The driveway will be located approximately 410 feet west of North 4th Avenue. Based on the proposed access spacing for the right-in/right-out driveway, a major deviation process through ODOT will be necessary to secure a permit for this access. A separate memorandum will be prepared independent of this report as part of the approach permit application.

RAILROAD CROSSING ON NORTH 4TH AVENUE

The City of Cornelius requested that the transportation impact study fully evaluate conditions at the Burlington Northern Santa Fe railroad crossing along North 4th Avenue, just north of the site. Research shows that this at-grade crossing exhibits no safety deficiencies. The crossing itself, across the railroad right-of-way is narrow, but wide enough for two-way vehicular travel, and sufficiently wide enough to accommodate the large trucks that will deliver to the proposed retail development. There is adequate signage and striping on the approaches to the crossing, in the form of advanced warning signs, stop signs, and pavement stencils. The pavement conditions at the crossing are also adequate, and there is adequate sight distance from the driver's perspective on both stop-controlled approaches. Additionally, the frequency of trains on this rail line is low, with up to six trains per week, or an average of one train every 24-hours. Additional research shows there have been no accidents at this crossing over the last five years. The same is true for the BNSF rail crossing to the east at North 10th Avenue, which has the same traffic controls and much higher traffic demand. Based on the analysis of existing conditions, and a comparison to the conditions at the other rail crossing at North 10th Avenue, there is no indication that increased traffic demand generated by the proposed development will result in a significant impact to vehicular safety at the North 4th Avenue rail crossing.

In terms of pedestrian safety, pedestrians must walk across the railroad tracks using the street pavement. Considering that vehicles must stop at this location, there is no reason to believe pedestrian safety is at risk because of the interaction with cars. Additionally, observations made in the field indicate pedestrian activity in the industrial area north of the railroad track is low. During a recent visit made during the weekday p.m. peak hour, no pedestrians were observed to cross the rail line.



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Section 5

Conclusions and Recommendations

Conclusions and Recommendations

Based on the results of the traffic impact analysis, the proposed retail development can be developed while maintaining acceptable levels of service and safety on the surrounding transportation system. The analysis developed the following findings and recommendations:

FINDINGS

Existing Conditions

During the weekday a.m., weekday p.m., and Saturday mid-day peak hours, all study area intersections currently operate within performance standards deemed acceptable by the City of Cornelius and ODOT, with the exception of the North Adair Street/North Yew Street intersection. The minor street approach in the southbound direction is currently operating at or near capacity during the weekday p.m. peak hour. This intersection operates acceptably during the other study time periods, and does not meet signal warrants.

Year 2006 Background Conditions

- Year 2006 background traffic conditions (without the proposed retail development) were estimated assuming one year of continued local and regional growth. Additionally, the traffic associated with five approved, or in-process developments identified in the site vicinity by City staff was accounted for in the analysis of year 2006 background conditions.
- Operational analysis of year 2006 background traffic conditions indicates that all of the study intersections are forecast to operate within acceptable standards during the weekday a.m., p.m., and Saturday midday peak hours, with the exception of the North Adair Street/North Yew Street intersection. The southbound approach to this intersection is forecast to continue operating at or near capacity during the weekday p.m. peak hour, and not meet traffic signal warrants.

Proposed Development Activities

- The site is expected to generate approximately 6,570 net new daily trips, with approximately 140 net new trips occurring during the weekday a.m. peak hour, 600 net new trips occurring during the weekday p.m. peak hour, and 940 net new trips occurring during the Saturday mid-day peak hour.
- Access to the site is proposed via three external driveways: one right-in/right out unsignalized driveway onto North Adair Street (OR 8) and two unsignalized driveways to North 4th Avenue.

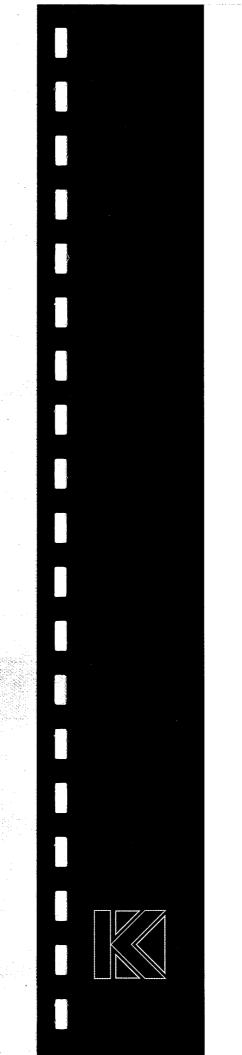
Year 2006 Total Traffic Conditions:

Under forecast year 2006 total traffic conditions (with the proposed retail development), all of the study intersections are forecast to function within acceptable operating standards during the weekday a.m., p.m., and Saturday mid-day peak hours, with the exception of the North Adair Street/North Yew Street intersection. The southbound approach to this intersection is forecast to operate over capacity during the weekday p.m. peak hour and the intersection is not forecast to meet traffic signal warrants.

- A queuing analysis determined that with proposed off-site transportation improvements in place, sufficient lane storage will exist at the study intersections in the immediate site vicinity on North 4th Avenue, North Adair Street, and West Baseline Street.
- Right-turn deceleration lane warrants will be satisfied at the proposed right-in/right-out driveway on North Adair Street (OR 8) under the weekday p.m. and Saturday mid-day peak hours.
- Although ODOT left-turn lane warrant criteria will be satisfied along North 4th Avenue at the southern site-access driveway, the traffic operations and vehicle queuing analysis results indicate there is no need for a left-turn lane.
- Without the proposed right-in/right-out site-access driveway to North Adair Street, the level-of-service and volume-to-capacity ratio will degrade at the upstream intersection at North Adair Street and North 4th Avenue, relative to conditions where the proposed site-access driveway is in place along North Adair Street.
- Based on the proposed access spacing for the right-in/right-out driveway to North Adair Street (OR 8), a major deviation process through ODOT will be necessary to secure an access permit.

RECOMMENDATIONS

- Widen North 4th Avenue to a four-lane cross-section between the North Adair Street and West Baseline Street (OR 8) couplet to accommodate side-by-side left turn lanes northbound and southbound.
- Construct a right-turn deceleration lane on North Adair Street (OR 8) at the proposed right-in/right-out site driveway. Proper design treatment would consist of 20 feet of pavement width to accommodate a 5-foot bicycle lane and a 15-foot right-turn deceleration lane. This would be separate from the pavement width that currently defines the two 12-foot westbound through travel lanes on the highway. The lane could be developed starting at the existing bus pullout located on the north side of North Adair Street (OR 8) and extended to the driveway location. Additionally, a bulb-out should be provided on the west corner of the driveway to force right-turning traffic exiting from the driveway to access the outside westbound through travel lane, while providing enough pavement width for a 5-foot bicycle lane.
- Construct a separate southbound right-turn lane with approximately 50 feet of striped storage at the North 4th Avenue/North Adair Street (OR 8) intersection in conjunction with site build-out.
- Landscaping along the site frontage of North Adair Street (OR 8) and North 4th Avenue should be maintained to ensure adequate sight distance at all site-access driveways.



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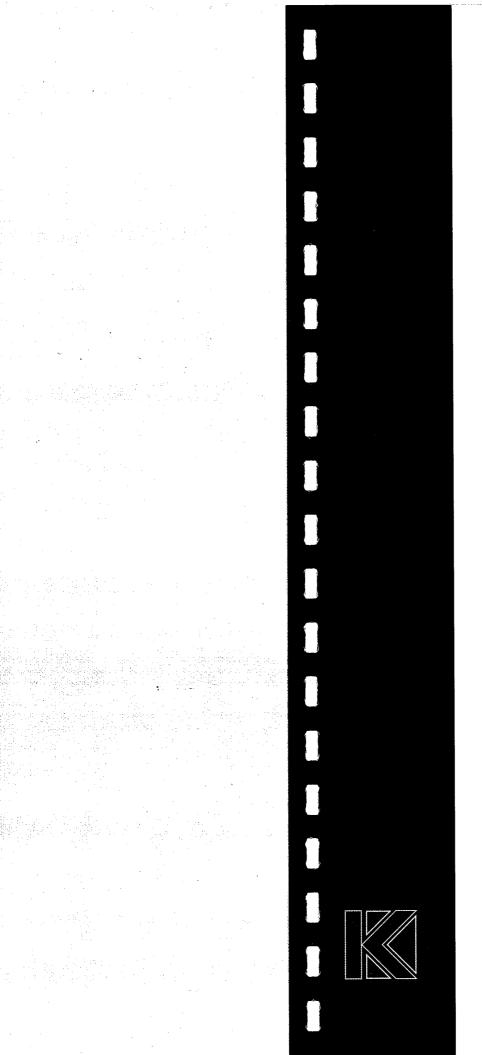
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Section 6

References

References

- 1. Kittelson & Associates, Inc. Transportation Impact Analysis for Proposed Zone Change (North Adair Street/North 4th Avenue). August 2005.
- 2. Tri-Met. http://www.trimet.org. May 2, 2005.
- 3. Transportation Research Board. Highway Capacity Manual. 2000.
- 4. The Oregon Department of Transportation. 1999 Oregon Highway Plan. 1999.
- 5. Institute of Transportation Engineers. ITE Trip Generation Manual, Seventh Edition. 2003.
- 6. Institute of Transportation Engineers. Trip Generation Handbook. 2004.



Appendix A

Scoping Letters

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Section 19

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A CONTRACTOR

MEMORANDUM

Date: July 20, 2005

Project #: 7059

To: Marty Jensvold, ODOT

From: Brian Dunn, P.E., Senior Engineer

Project: Retail Project At North 4th Avenue/North Adair Street (OR Hwy 8)

Subject: Scoping Letter for Transportation Impact Study

This memorandum outlines our proposed scope of work for the proposed retail project located along North Adair Street (OR Hwy 8), just west of North 4th Avenue in Cornelius. This proposed scope was prepared based on our review of on-going in-process developments and transportation improvement projects in the area, and a review of the City of Cornelius, Washington County, and ODOT traffic impact analysis requirements.

Project Description

The proposed retail development site is bounded by North Adair Street (OR Hwy 8) to the south, North 4th Avenue to the east, residential development to the north, and both commercial and vacant land to the west. A series of private access drives will be established to distribute site traffic to/from the surrounding public streets of North Adair Street and North 4th Avenue. The size of the proposed retail use is approximately 179,900 square feet. Since the proposed development will require a zone change, a future conditions (year 2020) analysis will be required to comply with the Transportation Planning Rule.

Trip Generation

The estimated trip generation was calculated based on empirical observations contained in the standard reference manual *Trip Generation*, 7th *Edition* (Institute of Transportation Engineers, 2003) with supporting information contained in the *Trip Generation Handbook* (Institute of Transportation Engineers, 2004). A summary of the trip generation is shown in Table 1.

Land Use	ITE Code*	, Size	Daily Trips	Weekday PM Peak Hour			Saturday Midday Peak Hour		
				Total	ln	Out	Total	In	Out
Shopping Center	820	179,902 sq. ft.	9,950	920	440	480	1,270	660	610
(Pass-By)**		179,902 sq. n.	3,380	320	160	160	330	165	165
Total Net New Trip	S		6,570	600	280	320	940	495	445

Notes:

- * Trip generation estimates are based on Institute of Transportation Engineers (ITE), Trip Generation, 7th Edition, 2003 for Shopping Center land use.
- ** Pass-by trip reductions for the retail center were determined from Table 5.6 and Figures 5.5 and 5.7 of ITE Trip Generation Handbook, 2004. A 34% pass-by rate was applied to daily trips and weekday p.m. peak hour trips. A 26% pass-by rate was applied to Saturday midday peak hour trips.

As shown in Table 1, the site is estimated to generate 6,570 net new daily trips, with 600 net new trips (280 in, 320 out) occurring in the weekday p.m. peak hour and 940 net new trips (495 in, 445 out) occurring in the Saturday midday peak hour.

Trip Distribution and Assignment

The estimated trip distribution pattern for site build out will be based on observed traffic patterns, select zone traffic assignments using the travel demand forecasting model developed by Washington County, and from traffic counts conducted in the site vicinity. An estimated trip distribution pattern for the horizon year 2020 analyses will also consider planned improvements identified in Washington County's Transportation System Plan.

Analysis Periods

Based on a review of the City and ODOT's traffic impact study guidelines and our understanding of the Transportation Planning Rule, several scenarios will be analyzed to assess the traffic impacts related to the proposed retail development. These scenarios include the following:

- Base year 2005 conditions;
- Year 2006 background conditions;
- Year 2006 build-out conditions (proposed retail development);
- Year 2020 conditions (worst-case development under current zoning); and
- Year 2020 build-out conditions (worst-case development under proposed zoning).

Due to the retail nature of the site, traffic conditions for the weekday p.m. and Saturday midday peak hours will be analyzed. Due to the significant effects of planned roadway construction projects on travel patterns in the site vicinity, future year 2020 travel forecasts at the study intersections will be determined primarily through the use of the Washington County traffic model, with consideration given to historical growth along the OR Hwy 8 couplet and other inprocess developments.

Project #: 7059.0 Page 3

Study Intersections

The following intersections will be included in the analysis based on our understanding of the estimated site trip generation and distribution patterns and our review of the City and ODOT's traffic impact study guidelines:

- Pacific Avenue (OR Hwy 8)/Mountain View Lane;
- North Adair Street (OR Hwy 8)/North 4th Avenue;
- Baseline Street (OR Hwy 8)/South 4th Avenue;
- North Holladay Street/North 10th Avenue;
- North Adair Street (OR Hwy 8)/North 10th Avenue; and,
- Baseline Street (OR Hwy 8)/South 10th Avenue.
- North Adair Street (OR Hwy 8)/Site Driveway;
- North 4th Avenue/North Barlow Street/Southern Site Driveway; and
- North 4th Avenue/Northern Site Driveway.

Next Steps

At this time, we request that ODOT review this scoping letter and provide comments and for confirmation on the extents of the proposed scope. We would like to confirm the appropriate level of analysis so that we may proceed with the transportation impact study. Thank you for your assistance.

MEMORANDUM

Date: July 20, 2005

Project #: 7059

To: Dick Reynolds, City of Cornelius

From: Brian Dunn, P.E., Senior Engineer

Project: Retail Project At North 4th Avenue/North Adair Street (OR Hwy 8)

Subject: Scoping Letter for Transportation Impact Study

This memorandum outlines our proposed scope of work for the proposed retail project located along North Adair Street (OR Hwy 8), just west of North 4th Avenue in Cornelius. This proposed scope was prepared based on our review of on-going in-process developments and transportation improvement projects in the area, and a review of the City of Cornelius, Washington County, and ODOT traffic impact analysis requirements.

Project Description

The proposed retail development site is bounded by North Adair Street (OR Hwy 8) to the south, North 4th Avenue to the east, residential development to the north, and both commercial and vacant land to the west. A series of private access drives will be established to distribute site traffic to/from the surrounding public streets of North Adair Street and North 4th Avenue. The size of the proposed retail use is approximately 179,900 square feet. Since the proposed development will require a zone change, a future conditions (year 2020) analysis will be required to comply with the Transportation Planning Rule.

Trip Generation

The estimated trip generation was calculated based on empirical observations contained in the standard reference manual *Trip Generation*, 7th Edition (Institute of Transportation Engineers, 2003) with supporting information contained in the *Trip Generation Handbook* (Institute of Transportation Engineers, 2004). A summary of the trip generation is shown in Table 1.

Table 1 Estimated Trip Generation

Land Use	ITE Code*	Size	Daily Trips	Weekday PM Peak Hour			Saturday Midday Peak Hour		
	Oode		mps	Total	ln	Out	Total		Out
Shopping Center	820	179,902 sq. ft.	9,950	920	440	480	1,270	660	610
(Pass-By)**		770,002 54. 11.	3,380	320	160	160	330	In 660 165	165
Total Net New Trips		6,570	600	280	320	940	495	445	

Notes

- * Trip generation estimates are based on Institute of Transportation Engineers (ITE), *Trip Generation, 7th Edition, 2003* for Shopping Center land use.
- ** Pass-by trip reductions for the retail center were determined from Table 5.6 and Figures 5.5 and 5.7 of ITE Trip Generation Handbook, 2004. A 34% pass-by rate was applied to daily trips and weekday p.m. peak hour trips. A 26% pass-by rate was applied to Saturday midday peak hour trips.

As shown in Table 1, the site is estimated to generate 6,570 net new daily trips, with 600 net new trips (280 in, 320 out) occurring in the weekday p.m. peak hour and 940 net new trips (495 in, 445 out) occurring in the Saturday midday peak hour.

Trip Distribution and Assignment

The estimated trip distribution pattern for site build out will be based on observed traffic patterns, select zone traffic assignments using the travel demand forecasting model developed by Washington County, and from traffic counts conducted in the site vicinity. An estimated trip distribution pattern for the horizon year 2020 analyses will also consider planned improvements identified in Washington County's Transportation System Plan.

Analysis Periods

Based on a review of the City and ODOT's traffic impact study guidelines and our understanding of the Transportation Planning Rule, several scenarios will be analyzed to assess the traffic impacts related to the proposed retail development. These scenarios include the following:

- Base year 2005 conditions;
- Year 2006 background conditions;
- Year 2006 build-out conditions (proposed retail development);
- Year 2020 conditions (worst-case development under current zoning); and
- Year 2020 build-out conditions (worst-case development under proposed zoning).

Due to the retail nature of the site, traffic conditions for the weekday p.m. and Saturday midday peak hours will be analyzed. Due to the significant effects of planned roadway construction projects on travel patterns in the site vicinity, future year 2020 travel forecasts at the study intersections will be determined primarily through the use of the Washington County traffic model, with consideration given to historical growth along the OR Hwy 8 couplet and other inprocess developments.

Project #: 7059.0 Page 3

Study Intersections

The following intersections will be included in the analysis based on our understanding of the estimated site trip generation and distribution patterns and our review of the City and ODOT's traffic impact study guidelines:

- Pacific Avenue (OR Hwy 8)/Mountain View Lane;
- North Adair Street (OR Hwy 8)/North 4th Avenue;
- Baseline Street (OR Hwy 8)/South 4th Avenue;
- North Holladay Street/North 10th Avenue;
- North Adair Street (OR Hwy 8)/North 10th Avenue;
- Baseline Street (OR Hwy 8)/South 10th Avenue;
- North Adair Street (OR Hwy 8)/Site Driveway;
- North 4th Avenue/North Barlow Street/Southern Site Driveway; and
- North 4th Avenue/Northern Site Driveway.

Next Steps

At this time, we request that the City of Cornelius review this scoping letter and provide comments and for confirmation on the extents of the proposed scope. We would like to confirm the appropriate level of analysis so that we may proceed with the transportation impact study. Thank you for your assistance.



Oregon Department of Transportation

ODOT Region 1 123 NW Flanders St Portland, OR 97209 Telephone (503)731-8200 FAX (503)731-8259

August 5, 2005

Brian Dunn, P.E., Senior Engineer Kittelson & Associates 610 SW Alder, Suite 700 Portland, Oregon, 97205

Subject:

Traffic Impact Study Scope for proposed zone change and retail

development on OR8 (N. Adair St) just to the west of N. 4th Avenue in

Cornelius, Oregon

Dr. Mr. Dunn

We have received your proposed scope of work to be included in the Transportation Impact Study (TIS) associated with the proposed zone change for the proposed retail development site as described in your Memorandum dated July 20, 2005. Please note the following comments when completing your Study.

As you stated in your memorandum the TIS shall address the requirements of the Transportation Planning Rule (OAR660-012-0060). If the zone change is approved, any land use that is allowed outright under the new zone can be developed on the property. Due to this fact, the analysis must assume that the property is developed with the maximum potential allowed use (the use that generates the most vehicular trips) under the new zone in order to determine adequacy of the transportation facilities.

The TIS shall consider the proposed zone change separately from the proposed land use proposal.

For the proposed zone change, ODOT has determined the reasonable worst case scenario to be a '<u>supermarket</u>' (ITE Code 850). When deriving the trip generation, use the maximum reasonable square footage a supermarket could fit on the proposed zone change lots under the City of Cornelius zoning. If you know of another land use or combination of land uses that could generate higher trips than the maximum reasonable square footage of a supermarket, use this trip generation in zone change portion of the TIS.

ODOT Log No:

For the land use proposal ODOT has determined the reasonable worst case scenario to be a 'free standing discount store' ITE Code 815. Another land use may be considered if is consistent with the site plan used for the Land Use Application

In addition to the intersections you listed in your memorandum please include analysis of the OR8/Quince St intersection in the TIS. The TIS shall include an analysis with and without the North Adair Street Site Driveway; and demonstrate whether the North Adair Street / 4th Avenue intersection and the two site driveways on 4th Avenue would operate safely and reasonably with and without a site driveway on North Adair Street.

The TIS shall include descriptions of the existing highway conditions in the vicinity of the proposal. This information shall include the number of lanes on the highway, lane designations, bike/pedestrian facilities, and transit facilities. The proposed development description with site plan shall be included in the TIS (Note: Vehicle turning templates could be provided in the site plan to demonstrate the site's ability for circulation).

Accident history for at least the 3 most recent years should also be included in the TIS with assessment of the accident history showing any trend of collisions. If any trend of collisions occurs, the TIS shall state whether any reasonable actions can mitigate these trends.

Traffic counts used in the TIS analysis shall not be more than a year old from the date the TIS is prepared. Counts should not be taken within a week of state or federal holidays. Counts on the weekday shall be conducted either on a Tuesday, Wednesday, or Thursday. The presence of schools in the area should be considered when determining the date of counts. It is preferable to count when schools are in session.

The TIS shall include capacity analysis, document findings, and include recommendations for mitigation of traffic impacts. An intersection sight distance (ISD) measurement for the proposed North Adair Street approach shall be included in the TIS to ensure that the driveway adheres to the 500 foot ISD standard. Turn lane warrants (if applicable) and turn lane storage requirements shall also be included in the TIS.

A volume-to-capacity ratio (v/c) calculation for all highway and site driveway intersections listed in the TIS. The Oregon Highway Plan (OHP) mobility standards require the OR 8 intersections to have a v/c no greater than 0.99 except for the North Adair Street / 10th Avenue and the Baseline Street / 10th Avenue intersections.

The OHP mobility standards require the 10th intersections to have a v/c no greater than 1.10 for the first hour and 0.99 for the second hour. This means you need to do traffic counts greater than two hours for the North Adair Street / 10th Avenue and the Baseline Street / 10th Avenue intersections to determine whether the 2nd highest hour falls before or after the PM peak hour.

The Application of Oregon Highway Plan Mobility Standards requires the TIS to use ODOT's traffic signal timing for the analysis of our intersections. Traffic signals located in the couplet are coordinated and this coordination shall be considered in both the mobility and 95th-percentile queue analyses. Our office will supply you with the traffic signal timing and parameters.

ODOT Log No:

- 4th & alan is mader controller - Support timing

A 95th percentile queue analysis shall be conducted for all controlled points that contrast the <u>background</u> queues versus the total traffic queues for all movements. In this analysis, the TIS shall provide the length of storage lanes and distance from other intersections. The queue analysis shall consider three different types of queues: overflow, spillback, and storage blocking queues.

The TIS shall include an Appendix that contains all traffic count data, worksheets, and calculations used in the analysis.

To provide better consistency in review comments, our office recommends the City's land use application and ODOT's approach permit application process both occur concurrently. To obtain an approach permit application, contact Steve Schalk, District 2A Access Coordinator, at (503) 229-5002.

If there are any questions regarding the information in this letter, please contact me at (503) 731-8221.

Sincerely,

Jason Grassman, P.E.

. M. OREGON

Traffic Development Review Team Leader

cc:

Tim Wilson, Region 1 Senior Planner

Martin Jensvold, Region 1 Access Management Engineer

Steve Schalk, District 2A Access Coordinator

Dick Reynolds, City of Cornelius



Oregon Department of Transportation

ODOT Region 1 123 NW Flanders St Portland, OR 97209 Telephone (503)731-8200 FAX (503)731-8259

August 17, 2005

Brian Dunn, P.E., Senior Engineer Kittelson & Associates 610 SW Alder, Suite 700 Portland, Oregon, 97205

Subject:

Addendum to Traffic Impact Study Scope for proposed zone change and

retail development on OR8 (N. Adair St) just to the west of N. 4th Avenue

in Cornelius, Oregon

Dr. Mr. Dunn

Based on our meeting yesterday, August 11, 2005, I have listed several modifications to my Traffic Impact Study Scope memo (dated August 5, 2005).

You have proposed to use "Shopping Center" (ITE Code 820) as a worst-case scenario for both the zone change and the land use application. ODOT is requesting that you provide a memorandum justifying why this is a reasonable worst case scenario as it differs from the ODOT scope which requested "Supermarket" (ITE Code 850) be used for the zone change and "Free Standing Discount Store" (ITE Code 815) be used for the land use application.

In addition to the intersections listed previously in your scoping letter (date) and in ODOT's August 5th scope, we request that the study analyze the rail crossings on N. 4th . Currently, this at-grade crossing only has cross buck controls.

The study must provide WB-67 truck turning templates if the site circulation is designed such that trucks will use the highway approach.

The study shall include longer counts as per Table 5 of the *Oregon Highway Plan* for the OR 8 / 10th Avenue intersection if the v/c falls between 0.99 and 1.10. The traffic counts must be taken for the OR 8 / OR 47 intersection while school is in-session. Traffic counts must also be collected on the Yew Street approaches to OR 8 and factor in the highway counts from Mountain View and 4th Avenue.

The study shall apply the Application of *Oregon Highway Plan* Mobility Standards on both the coordinated and uncoordinated traffic signals on OR 8. Use ODOT's traffic

ODOT Log No: 2225

signal timing for the OR 8 couplet intersections at 4th Avenue and 10th Avenue. ODOT's master signal controller is located at 4th Avenue and Adair Street.

If there are any questions regarding the information in this letter, please contact me at (503) 731-8221.

Sincerely,

[']J∕ason Grassman, P.E.

Traffic Development Review Team Leader

SENGINEER 56,138PE Jun. M. Jassun OREGON Ho, M. GRASSOO S Jun. 30.

CC:

Tim Wilson, Region 1 Senior Planner Sonya Kazen, Region 1 Associate Planner Martin Jensvold, Region 1 Access Management Engineer Steve Schalk, District 2A Access Coordinator Dick Reynolds, City of Cornelius

MEMORANDUM

Date: August 18, 2005

Project #: 7059

To: Dick Reynolds, City of Cornelius

Jason Grassman, ODOT Region 1

From: Brian Dunn, P.E., Senior Engineer

Project: Retail Project At North 4th Avenue/North Adair Street (OR Hwy 8)

Subject: Confirmation of Revised Scoping Letter for Transportation Impact Study

This memorandum constitutes the revised scope of work proposed for the retail project located along North Adair Street (OR Hwy 8), just west of North 4th Avenue in Cornelius. This revised scope was prepared based on our first scoping letter dated July 20, 2005, our discussions with city staff at a pre-application meeting on July 22, 2005, from a letter received from ODOT Region 1 on August 5, 2005 and from a discussion with ODOT Region 1 staff on August 11, 2005. The purpose of this revised memorandum is to receive final confirmation from both the City of Cornelius and ODOT as to the proper scope for preparing the transportation impact study.

Project Description

The proposed retail development site is bounded by North Adair Street (OR Hwy 8) to the south, North 4th Avenue to the east, residential development to the north, and both commercial and vacant land to the west. A series of private access drives will be established to distribute site traffic to/from the surrounding public streets of North Adair Street and North 4th Avenue. The size of the proposed retail use is approximately 179,900 square feet.

Since the proposed development will require a zone change for a small plat from A-2 (Multi-Family) to C-2 (Commercial), a long-range analysis of transportation impacts will be required to demonstrate compliance with the Transportation Planning Rule.

Trip Generation

The estimated reasonable worst-case trip generation associated with the proposed zone change will based on empirical observations contained in the standard reference manual *Trip Generation*, 7th Edition (Institute of Transportation Engineers, 2003) with supporting information contained in the *Trip Generation Handbook* (Institute of Transportation Engineers, 2004). For the current A-2 zone, the trip rates associated with an apartment building will be used. For the proposed C-2 zone, the trip rates associated with a fast-food restaurant will be used, which is more conservative than the "supermarket" land use proposed by ODOT.

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Project #: 7059.0 Page 2

The estimated trip generation for the proposed site development will also be based on the standard reference manual *Trip Generation*, 7th *Edition* with supporting information contained in the *Trip Generation Handbook*. A summary of the estimated site trip generation is shown in Table 1 for the proposed retail development.

Table 1
Estimated Site Trip Generation for Proposed Retail Development

Land Use	ITE Code*	Size	Daily Trips	Weekday PM Peak Hour			Saturday Midday Peak Hour			
	Code		mps	Total	ln	Out	Total	In	Out	
Shopping Center	000	820	179,902 sq. ft.	9,950	920	440	480	1,270	660	610
(Pass-By)**		179,902 sq. it.	3,380	320	160	160	330	ny Peak I In	165	
Total Net New Trips		6,570	600	280	320	940	495	445		

Notes:

- * Trip generation estimates are based on Institute of Transportation Engineers (ITE), *Trip Generation, 7th Edition, 2003* for Shopping Center land use.
- ** Pass-by trip reductions for the retail center were determined from Table 5.6 and Figures 5.5 and 5.7 of ITE Trip Generation Handbook, 2004. A 34% pass-by rate was applied to daily trips and weekday p.m. peak hour trips. A 26% pass-by rate was applied to Saturday midday peak hour trips.

As shown in Table 1, the proposed site development is estimated to generate 6,570 net new daily trips, with 600 net new trips (280 in, 320 out) occurring in the weekday p.m. peak hour and 940 net new trips (495 in, 445 out) occurring in the Saturday midday peak hour.

Trip Distribution and Assignment

The estimated trip distribution pattern for the estimated site build out year 2006 will be based on observed traffic count patterns, select zone traffic assignments using the travel demand forecasting model developed by Washington County, and an understanding of the locations of other similar retail uses. An estimated trip distribution pattern for the planning horizon year analyses for the proposed zone change will also consider the above criteria, but also consider the effects of funded or planned transportation improvements reasonably likely to occur as identified in the adopted transportation system plans of the cities of Cornelius and Forest Grove, as well as the adopted METRO Regional Transportation Plan.

Analysis Scenarios and Periods

Based on a review of the City and ODOT's traffic impact study guidelines and our understanding of the Transportation Planning Rule, several scenarios will be analyzed to assess the traffic impacts related to the proposed retail development. These scenarios include the following:

Proposed Zone Change Scenarios:

- Build-out year 2006 conditions (worst-case development under proposed zoning);
- Build-out year 2006 conditions (worst-case development under current zoning);
- Planning horizon year conditions (worst-case development under proposed zoning); and
- Planning horizon year conditions (worst-case development under current zoning).

Proposed Site Development Scenarios:

- Base year 2005 conditions;
- Year 2006 background conditions; and
- Year 2006 build-out conditions (proposed retail development).

Due to the retail nature of the site, traffic conditions for the weekday p.m. and Saturday midday peak hours will be analyzed. All traffic forecast volumes prepared for the short-term period will rely on historical growth patterns along the OR Hwy 8 couplet and will include traffic associated with approved in-process developments. Due to the significant effects of planned roadway construction projects on travel patterns in the site vicinity, traffic volumes for the planning horizon year at the study intersections will be determined using the traffic forecasts contained in the adopted 2005 City of Cornelius Transportation System Plan and the adopted 1999 City of Forest Grove Transportation System Plan.

Per the request of ODOT, a comparison will be made between traffic conditions with and without the proposed site-access driveway to North Adair Street.

Study Intersections

The following intersections will be included in the analysis based on our understanding of the estimated site trip generation and distribution patterns, our review of the City and ODOT's traffic impact study guidelines, and our verbal discussions with City and ODOT staff:

- Pacific Avenue (OR Hwy 8)/Mountain View Lane;
- North Adair Street (OR Hwy 8)/North 4th Avenue;
- Baseline Street (OR Hwy 8)/South 4th Avenue;
- North Holladay Street/North 10th Avenue;
- North Adair Street (OR Hwy 8)/North 10th Avenue; and,
- Baseline Street (OR Hwy 8)/South 10th Avenue.
- North Adair Street (OR Hwy 8)/Site Driveway;
- North 4th Avenue/North Barlow Street/Southern Site Driveway;
- North 4th Avenue/Northern Site Driveway:
- South 4th Avenue/Heather Street; (Added per City request)
- South 10th Avenue/Dogwood Street; (Added per City request)
- North Adair Street (OR Hwy 8)/Yew Avenue; (Added per City request)
- Baseline Street (OR Hwy 8)/Yew Avenue; (Added per City request) and
- Pacific Avenue (OR Hwy 8)/Quince Street; (Added per ODOT request)

Next Steps

At this time, we request that the City and ODOT review this revised scoping letter and provide confirmation on the extents of the proposed scope. If a response is not received within one week of this date August 17, 2005, we will assume that the revised scope for this project is agreeable to all parties. Thank you for your assistance.



CITY OF CORNELIUS

August 19, 2005

Daniel Boultinghouse PacLand 6400 SE Lake road Suite 300 Portland, OR 97222



Phone: (503) 357-9112

Fax: (503) 357-7775

RE: Proposed Wal-Mart Store at N. 4th & Adair Street – Highway Commercial, C-2

Dear Daniel,

At the pre-application meeting that we held on July 26, 2005 with you and some of your project team for the proposed Wal-Mart Store you indicated that you would like staff to provide any further feedback we might come up with on the preliminary site plan. In an effort to work with you I'd like to provide some preliminary feedback on the design of this site and some general code compliance concerns. These issues are general in nature and you may already be aware of these and be working on them, but they could affect the overall site design.

- 1. Adair Street deceleration and turn lane that conflicts with the existing Tri-Met Bus Stop. I know that you are currently working with Tri-Met staff on this issue.
- 2. Use and Improvements to N. 4th Avenue:
 - a) Section 11.20.56.B.2 of the City Development & Zoning Code states, the minimum public street width for commercial development shall be: Collector Sixty (60) feet of right-of-way and thirty-six (36) feet of pavement curb to curb. Additional street width for turn lanes may be required if warranted by traffic volumes generated by the development. This Development Standard is pretty straight forward and as we have discussed N. 4th Avenue does not have a 60 foot right-of-way. A 60 foot ROW is necessary in order to provide the minimum and safe required public improvements. I am unclear on how you intend to address this lack of right-of-way.
 - b) Turn Lanes. At this point we have not seen the results of your traffic study, but I can't imagine that a turn lane would not be needed on N. 4th Avenue. The traffic generation created by the new store coupled with the existing residential uses/accesses on the east side of N. 4th Avenue appear to create safety issues that would warrant a separate turn lane into your proposed store.

- c) Inadequate right-of-way and improvements to the railroad crossing on N. 4th Avenue. Aside from customer traffic using this route over the RR crossing to access the new store, I understand Wal-Mart delivery trucks will also use this route some of the time. Improvements to the crossing will need to be addressed (I think ODOT has the same concern).
- 3. Left turn lane from Baseline onto N. 4th Avenue. Again, I know that we do not have traffic data to this point, but there are even fewer supermarket/variety stores in Forest Grove, which has twice the population as Cornelius. Therefore, a significant number of Wal-Mart customers will come from the west, many if not most of which will use personal vehicles and the only transportation facility for these shoppers to use to access the proposed site is Baseline and N. 4th Avenue. Therefore, I would think a left turn lane from Baseline onto N. 4th Avenue would be necessary.
- 4. Section 11.20.56.B.4 Internal sidewalks or pathways shall be provided to ensure safe and convenient pedestrian circulation throughout the development. There appears to be approximately 700 parking stalls on the east side of the proposed building and there is only one internal sidewalk to provide pedestrian access to the store. This single sidewalk is located on the north part of the parking lot. This may be convenient or safe for the abutting parking spaces, but not for the rest of the parking lot. I think you need to look at providing additional raised internal sidewalks to ensure safe, adequate internal pedestrian circulation.

I am sure as we get into fine tuning the design of this site that there may be additional changes for us to work together on. We will look more closely at the plans once we have a complete application. Thanks for the opportunity to work with you on this proposal.

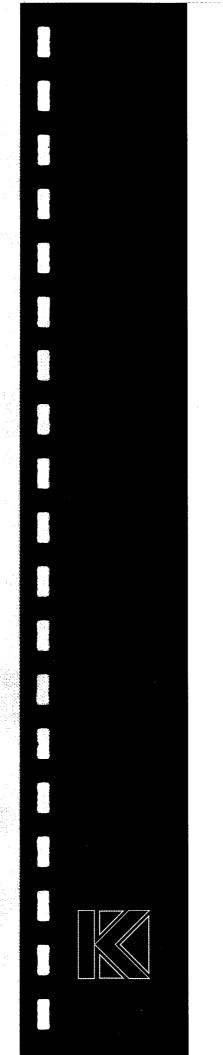
Sincerely,

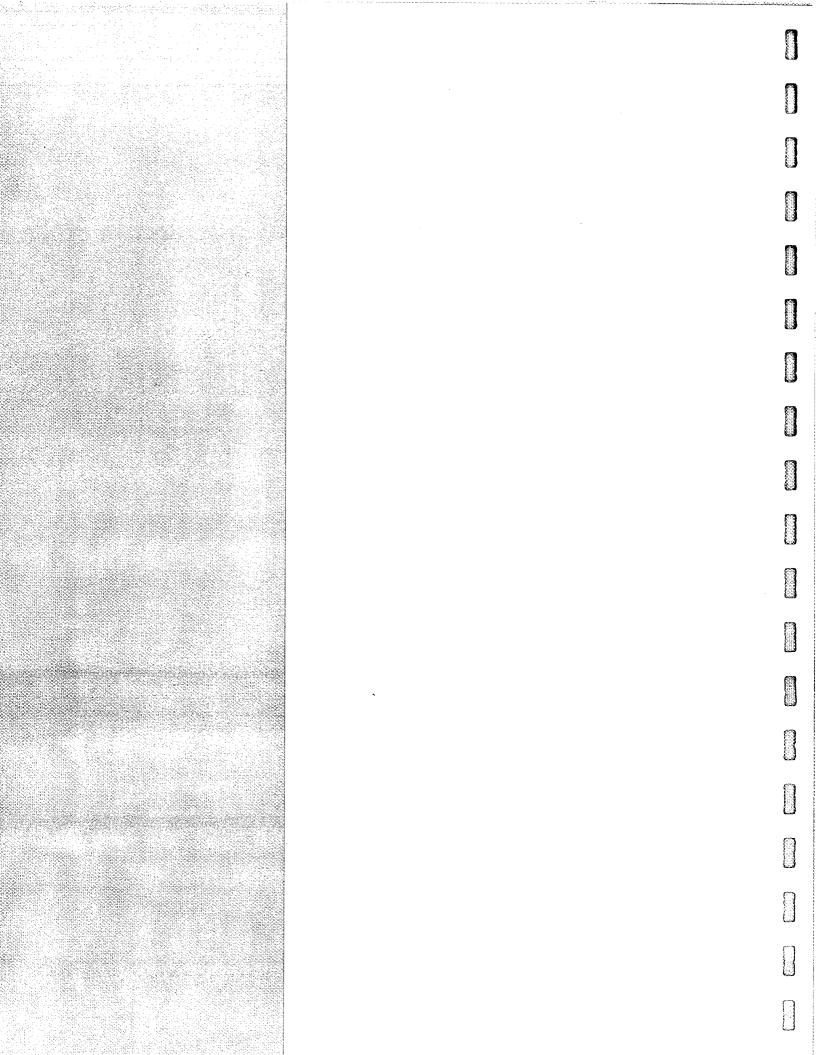
Dick Reynolds
Planning Manager

Cc: Brian Dunn, Kittelson & Associates, 610 SW Alder, Suite 700, Portland 97205 File

Phone: (503) 357-9112

Fax: (503) 357-7775





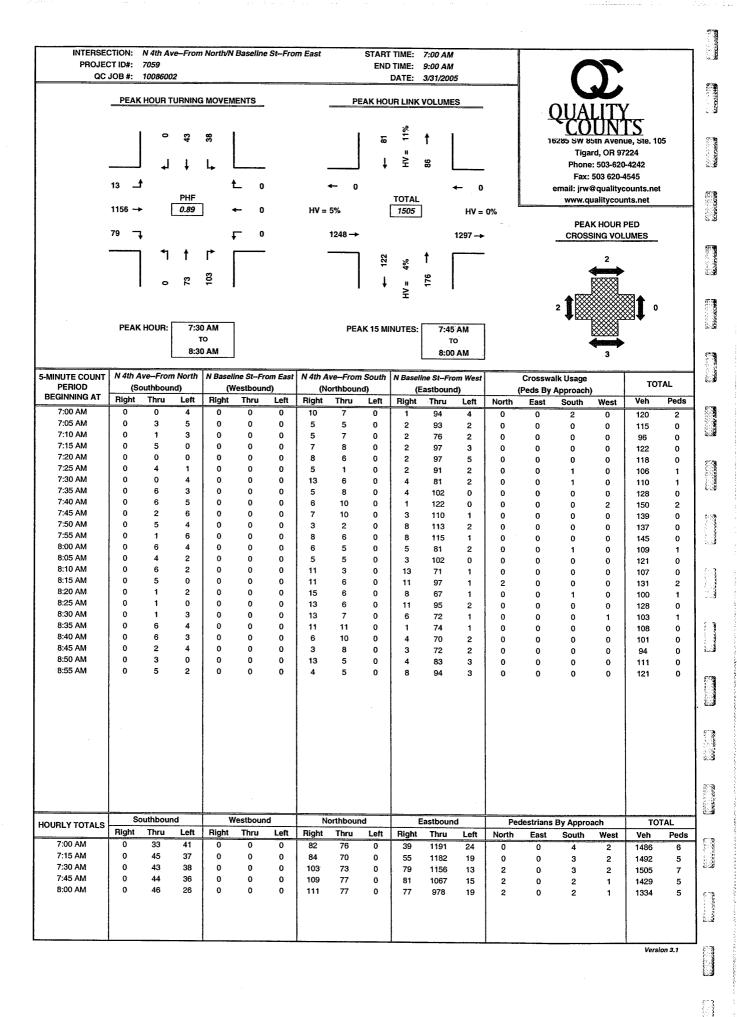
Appendix B

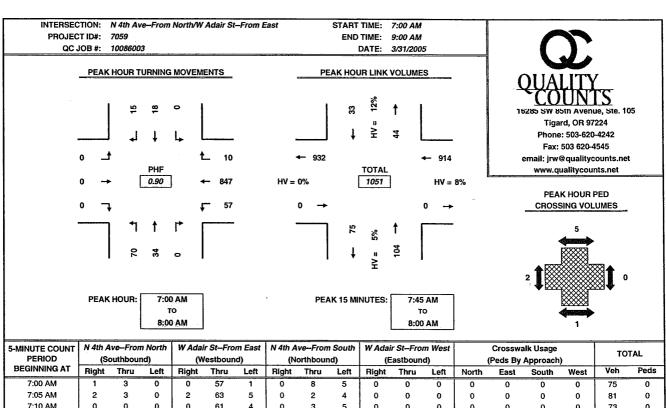
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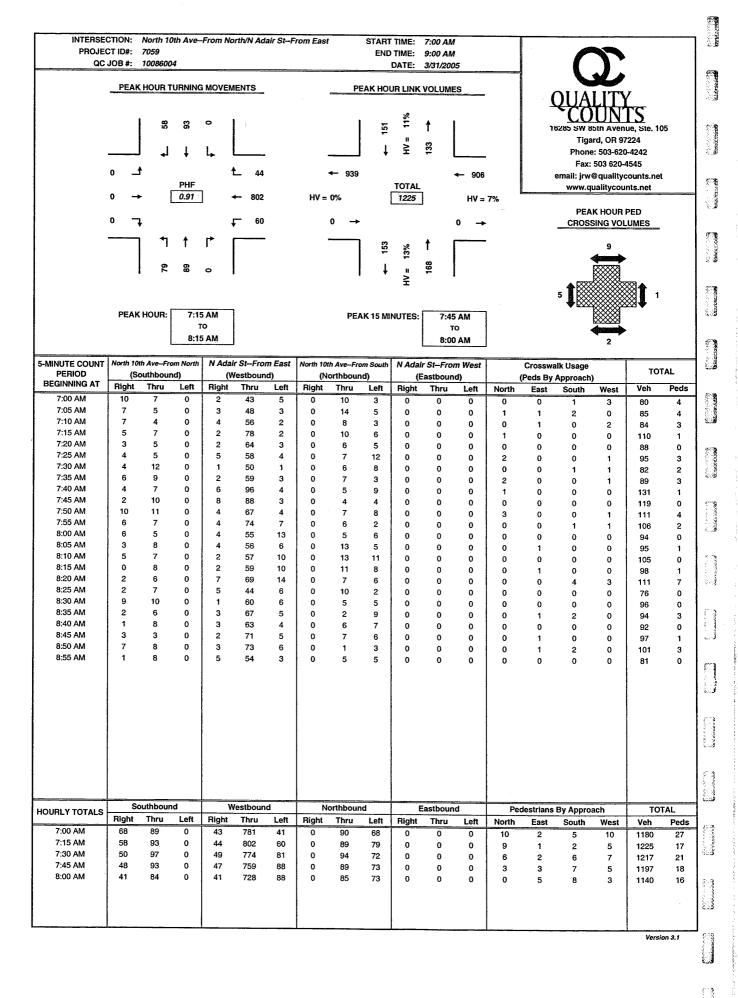
INTERSECTION: Grass Area--From North/Pacific Ave--From East START TIME: 7:00 AM PROJECT ID#: 7059 END TIME: 9:00 AM QC JOB #: 10086001 DATE: 3/31/2005 PEAK HOUR TURNING MOVEMENTS PEAK HOUR LINK VOLUMES % t ¥ ¥ Tigard, OR 97224 Phone: 503-620-4242 Fax: 503 620-4545 0 ← 900 ← 865 email: jrw@qualitycounts.net PHF TOTAL www.qualitycounts.net 2373 0.84 HV = 6% 1135 → HV = 8% PEAK HOUR PED 141 7 1276 → 1253 → CROSSING VOLUMES 2% PEAK HOUR: 7:15 AM PEAK 15 MINUTES: 7:45 AM TO TO 8:15 AM 8:00 AM

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7:05 AM	0	. 0	0	0	59	6	1	0	4	2	80	0	0	0	0	0	152	0
7:10 AM	0	0	0	0	55	10	1	0	4	7	77	0	0	0	0	0	154	0
7:15 AM	0	0	0	0	71	7	4	0	7	9	109	0	0	0	0	0	207	0
7:20 AM	0	0	0	0	51	9	9	0	5	15	85	0	1	0	0	0	174	1
7:25 AM	0	0	0	0	53	5	9	0	10	9	96	0	0	0	0	0	182	0
7:30 AM	0	0	0	0	72	5	9	0	9	9	75	0	0	0	1	1	179	2
7:35 AM	0	0	0	0	63	3	4	0	11	14	112	0	0	0	0	9	207	9
7:40 AM	0	0	0	0	85	7	10	0	14	15	78	0	1	0	2	7	209	10
7:45 AM	0	0	0	0	88	10	12	0	9	30	118	0	1	0	1	2	267	4
7:50 AM	0	0	0	0	75	8	16	0	20	20	106	0	1	0	0	8	245	9
7:55 AM	0	0	0	0	52	7	20	0	15	11	90	0	0	0	0	0	195	0
8:00 AM	0	0	0	0	78	9	16	0	9	5	92	0	0	0	1	0	209	1
8:05 AM	0	0	0	0	49	7	7	0	2	3	91	0	0	0	0	0	159	0
8:10 AM	0	0	0	0	49	2	2	0	3	1	83	0	0	0	0	0	140	0
8:15 AM	0	0	0	0	72	6	4	0	3	4	96	0	0	0	0	0	185	0
8:20 AM	0	0	0	0	59	2	7	. 0	6	2	81	0	0	0	0	0	157	0
8:25 AM	0	0	0	0	50	5	5	0	8	7	87	0	ا ه	0	0	0	162	0
8:30 AM	l o	0	0	0	57	0	9	0	5	7	74	0	0	0	0	5	152	5
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8:40 AM	0	0	0	0	93	8	5	0	7	8	79	0	0	0	1	0	200	1
8:45 AM	0	0	0	0	75	4	2	0	8	11	73	0	٥	0	0	0	173	0
8:50 AM	0	0	0	0	74	8	6	ō	6	9	86	ō	1	0	Ö	0	189	1
8:55 AM	٥	ō	0	0	69	10	3	Ö	4	8	84	0	o	0	0	0	178	0
													,					
IOURI V TOTAL O	S	outhbour	nd	V	/estboun	d	N	orthbou	nd	E	astboun	ıd	Ped	destrians	By Appro	ach	ТО	TAL
HOURLY TOTALS	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	North	East	South	West	Veh	Ped
7:00 AM	0	0	0	0	776	82	98	0	110	148	1125	0	6	0	5	28	2339	3
7:15 AM	0	0	0	0	786	79	118	0	114	141	1135	0	4	0	. 5	27	2373	36
7:30 AM	0	0	0	0	792	71	112	0	109	121	1109	0	3	0	5	27	2314	35
7:45 AM	0	0	0	0	781	68	107	0	94	101	1057	0	4	0	4	18	2208	26
8:00 AM	0	0	0	0	784	65	70	0	68	68	986	0	3	0	3	8	2041	14
		-																





5-MINUTE COUNT PERIOD		ve-Fron		ì	r St-Froi		•	veFrom		l	r StFroi				alk Usage		то	ΓAL
BEGINNING AT	Right	outhbour Thru	Left	Right	estboun Thru	d) Left	Right	orthboun Thru	d) Left	Right	astboun Thru	d) Left	North (F	Peds By East	Approach) South	West	Veh	Peds
7:00 AM	1	3	0	0	57	1	0	8	5	0	0	0	0	0	0	0	75	0
7:05 AM	2	3	0	2	63	5	o	2	4	0	0	0	0	0	0	ő	81	0
7:10 AM	0	0	0	0	61	4	ő	3	5	0	0	o	0	0	0	ő	73	0
7:15 AM	2	1	0	ő	78	4	ő	6	6	ő	0	0	0	0	1	ő	97	1
7:20 AM	1	0	0	ő	66	0	0	4	5	0	0	0	0	0	0	0	76	0
7:25 AM	1	1	0	2	73	4	0	1	2	ő	0	0	1	0	0	0	84	1
7:30 AM	1	2	0	1	59	3	ő	4	5	١٥	0	0	1	0	0	0	75	1
7:35 AM	1	3	0	2	55	6	0	0	8	0	0	0	Ö	0	0	0	75 75	o
7:40 AM	1	1	0	1	97	10	١٥	2	10	0	0	0	2	0	0	2	122	4
7:45 AM	2	1	0	2	89	6	0	1	7	0	0	0	1	0	0	0	108	1
7:50 AM	2	1	o	ا آ	81	9	0	2	7	0	0	0	0	0	0	0	103	0
7:55 AM	1	2	0	0	68	5	0	1	6	0	0	0	0	0	0	0	83	0
8:00 AM	2	1	0	1	63	9	0	3	3	0	0	0	2	0	0	0	82	2
8:05 AM	1	1	0	انا	54	6	0	0	4	0	0	0	0	1	1	0	66	2
8:10 AM	0	0	0	1	48	7	0	2	4	0	0	0	0	0	0	0	62	0
8:15 AM	0	2	0	o	46 74	4	0	1	6	0	0	0	0	0	0	0	87	0
8:20 AM	2	1	0	0	62	1	0	2	4	0	0	-	-	_	_	0	72	0
8:25 AM	0	0	0	3	52 52	1	0	2		0	0	0	0	0	0			
8:30 AM	2	2	0	1	52 58	2	0	0	7	1	-	0	0	0	0	0	65	0
	1	2	0	2	58 78		1 -		8	0	0	0	0	0	0	0	73	0
8:35 AM		4	0			10	0	1	10	0	0	0	1	0	0	0	104	1
8:40 AM	2		-	1	64	4	0	3	8	0	0	0	0	0	0	0	86	0
8:45 AM	2 6	2	0	0	69	4	0	2	11	0	0	0	0	0	0	0	90	0
8:50 AM	_	0	0	3	81	5	0	1	6	0	0	0	1	0	0	0	102	1
8:55 AM	3	0	0	0	71	5	0	2	6	0	0	0	1	0	0	0	87	1
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	S	outhbou	nd	V	Vestboun	d	N	orthboun	d		astbour	nd :	Per	lestrians	By Appro	ach	то	TAL
HOURLY TOTALS	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	North	East	South	West	Veh	Ped
7:00 AM	15	18	0	10	847	57	0	34	70	0	0	0	5	0	1	2	1051	8
7:15 AM	15	14	0	10	831	69	0	26	67	0	0	0	7	1	2	2	1032	12
7:30 AM	13	15	0	11	802	67	0	20	71	l ŏ	0	0	6	1	1	2	999	10
7:45 AM	15	17	0	11	791	64	0	18	74	o	0	0	4	1	1	0	990	6
8:00 AM	21	.15	Ö	12	774	58	0	19	77	ő	0	0	5	1	1	0	976	7
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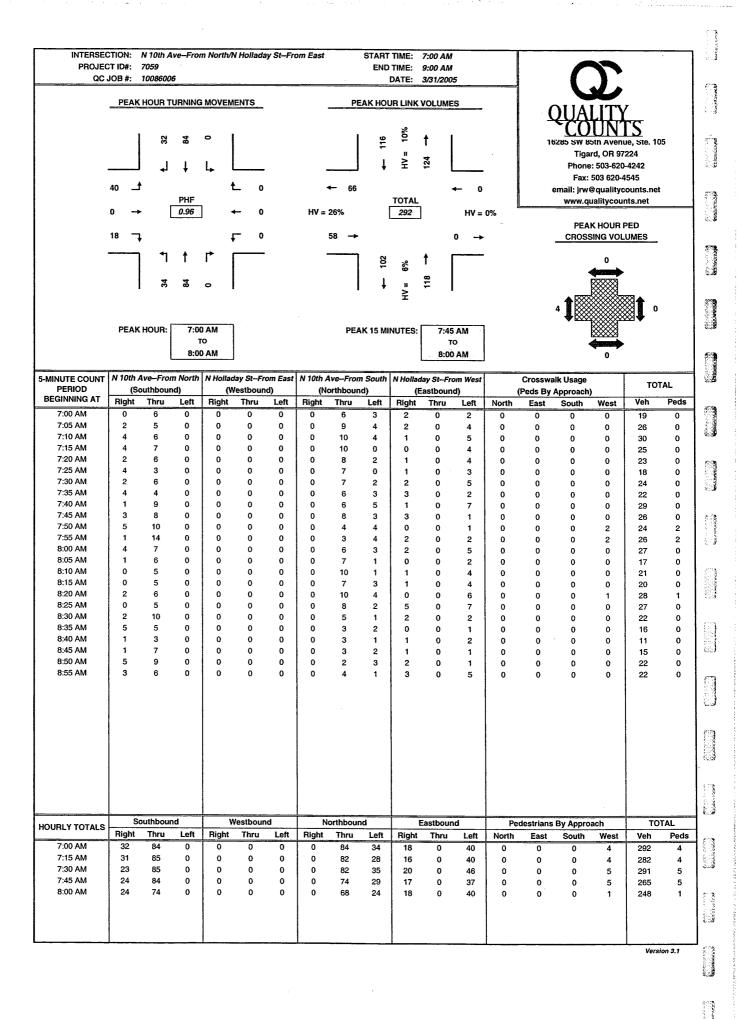


INTERSECTION: N 10th Ave-From North/W Baseline St--From East START TIME: 7:00 AM PROJECT ID#: 7059 END TIME: 9:00 AM QC JOB #: 10086005 DATE: 3/31/2005 PEAK HOUR TURNING MOVEMENTS PEAK HOUR LINK VOLUMES 2 t 186 : :: } Tigard, OR 97224 120 Phone: 503-620-4242 Fax: 503 620-4545 70 0 email: jrw@qualitycounts.net PHF TOTAL www.qualitycounts.net 1171 → 0.90 HV = 5% 1706 HV = 0% PEAK HOUR PED 45 1286 → CROSSING VOLUMES 1375 → %6 8 134 PEAK HOUR: 7:30 AM PEAK 15 MINUTES: 7:45 AM TO

8:30 AM

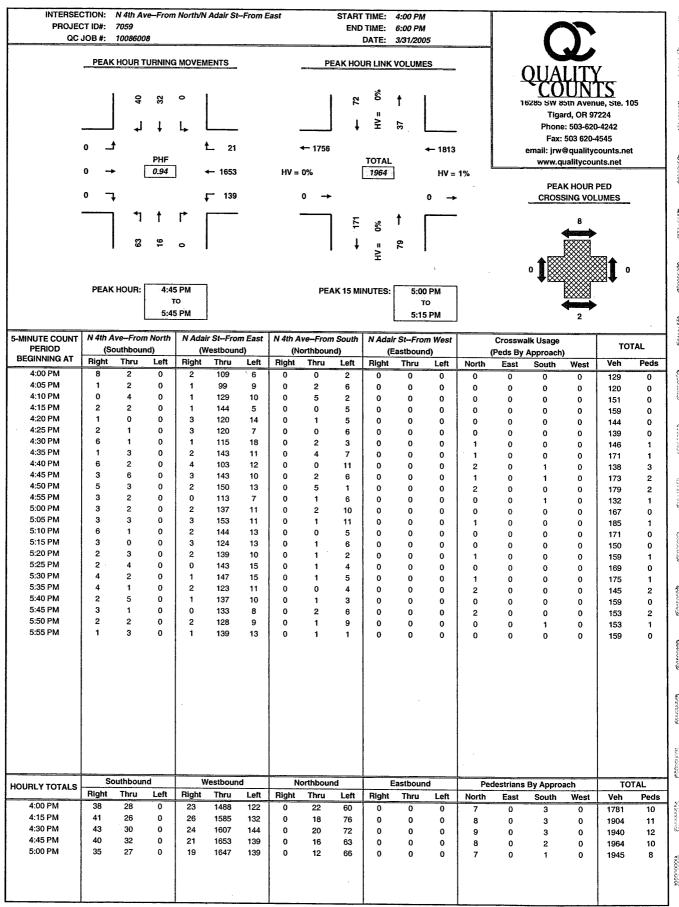
8:00 AM

-MINUTE COUNT PERIOD	N 10th A (Sc	tve-From outhbour			ne St-Fro estbound		N 10th A	veFron orthboun		W Baselii (Ea	ne St-Fro astbound	- 1		Crosswa Peds By	ik Usage Approach)	,	тот	AL
BEGINNING AT	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	North	East	South	West	Veh	Ped
7:00 AM	0	6	4	0	0	0	7	5	0	4	96	5	1	0	0	0	127	1
7:05 AM	0	7	4	0	0	0	12	13	0	9	84	6	0	0	0	4	135	4
7:10 AM	0	4	3	0	0	0	9	11	0	5	84	3	0	0	0 -	0	119	0
7:15 AM	0	4	6	0	0	0	8	6	0	1	97	4	1	0	0	1	126	2
7:20 AM	0	3	2	0	0	0	12	12	0	3	87	5	0	0	0	0	124	C
7:25 AM	0	9	3	0	0	0	5	10	0	4	96	5	0	0	0	2	132	2
7:30 AM	0	8	5	0	0	0	11	9	0	5	84	5	0	0	0	1	127	1
, 7:35 AM	0	5	6	0	0	0	15	11	0	2	104	2	2	0	0	2	145	4
7:40 AM	0	7	8	0	0	0	6	4	0	2	104	8	0	0	0	2	139	2
7:45 AM	0	3	8	0	0	0	9	12	0	5	114	3	0	0	0	0	154	C
7:50 AM	0	8	10	0	0	0	8	6	0	5	121	5	0	0	0	0	163	(
7:55 AM	0	11	5	0	0	0	8	5	0	5	114	7	0	0	0	o l	155	(
8:00 AM	0	13	5	0	0	0	9	6	0	4	80	6	0	0	0	0	123	(
8:05 AM	0	9	1	0	0	0	16	7	0	4	94	10	0	0	1	1	141	2
8:10 AM	0	14	5	0	0	0	21	12	0	2	79	12	0	0	0	0	145	(
8:15 AM	0	12	10	0	0	0	15	16	0	5	91	3	0	0	0	o	152	(
8:20 AM	0	12	3	0	0	0	9	8	0	5	89	4	0	0	0	0	130	
8:25 AM	lo	14	4	0	0	0	7	4	0	1	97	5	0	0	Ö	0	132	
8:30 AM	0	6	7	0	0	0	6	7	ō	3	83	5	o	0	0	ő	117	
8:35 AM	0	6	6	0	ō	ō	9	11	0	1	82	3	o	0	0	ő	118	
8:40 AM	ō	6	4	0	0	Ō	11	4	Ö	4	75	3	0	0	0	0	107	
8:45 AM	0	7	5	ŏ	Ö	0	7	8	0	4	72	5	1	0	0	0	108	
8:50 AM	ő	9	4	ő	0	0	9	5	0	0	95	2	0	0	0	0	124	
8:55 AM	0	5	5	0	0	0	11	6	0	2	95 95	3	0	0	2	0	124	
OURLY TOTALS		outhbou			estboun/			orthbou			astboun		 		By Appro			TAL
700 114	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	North	East	South	West	Veh	P
7:00 AM	0	75 04	64	0	0	0	110	104	0	50	1185	58	4	0	0	12	1646	
7:15 AM	0	94	64	0	0	0	128	100	0	42	1174	72	3	0	1	9	1674	
7:30 AM	0	116	70	0	0	0	134	100	0	45,	1171	70	2	0	1	6	1706	
7:45 AM	0	114	68	0	0	0	128	98	0	44	1119	66	0	0	1	1	1637	
8:00 AM	0	113	59	0	0	0	130	94	0	35	1032	61	1	0	3	1	1524	



INTERSECTION: Grass Area--From North/Pacific Hwy--From East START TIME: 4:00 PM PROJECT ID#: 7059 END TIME: 6:00 PM QC JOB #: 10086007 DATE: 3/31/2005 PEAK HOUR TURNING MOVEMENTS PEAK HOUR LINK VOLUMES % t **=** Tigard, OR 97224 Phone: 503-620-4242 Fax: 503 620-4545 0 ← 1691 ← 1683 email: jrw@qualitycounts.net PHF TOTAL www.qualitycounts.net 1304 → 0.95 ← 1565 HV = 2% 3289 HV = 3% PEAK HOUR PED T 118 CROSSING VOLUMES 94 1398 → 1386 → % PEAK HOUR: 4:30 PM PEAK 15 MINUTES: 5:00 PM то то 5:30 PM 5:15 PM

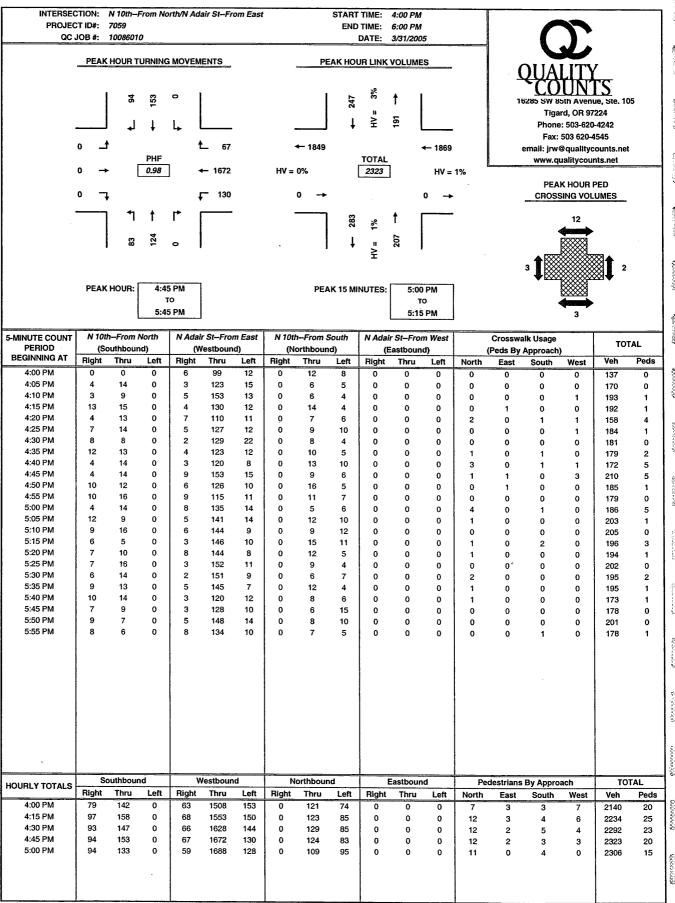
		ı														•		
5-MINUTE COUNT	Grass A	reaFro	m North	Pacific I	lwy–Fro	m East	Mountain V	lew LaneFi	rom South	Pacific H	łwyFro	m West		Crosswa	lk Usage	<u>-</u>	703	FA1
PERIOD	(Sc	outhbour	nd)	(W	estboun	d)	(No	orthboun	d)	(E	astbound	d)	(Peds By	Approach)	, 1	10	ΓAL
BEGINNING AT	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	North	East	South	West	Veh	Peds
4:00 PM	0	0	0	0	94	8	10	0	13	10	119	0	0	0	0	0	254	0
4:05 PM	0	0	0	0	89	3	7	0	17	8	112	0	0	0	0	0	236	0
4:10 PM	0	0	0	0	137	9	8	0	10	8	94	0	0	0	0	2	266	2
4:15 PM	0	0	0	0	134	16	2	0	3	7	111	0	0	0	0	0	273	0
4:20 PM	0	0	. 0	Ó	109	8	7	0	11	8	91	0	0	0	0	1	234	1
4:25 PM	0	0	0	0	110	4	6	0	10	6	125	0	0	0	0	1	261	1
4:30 PM	0	0	0	0	128	6	7	0	8	8	105	0	0	0	0	0	262	0
4:35 PM	0	0	0	0	133	17	2	0	9	4	105	0	0	0	0	0	270	0
4:40 PM	0	0	0	0	113	5	4	0	10	7	126	0	0	ō	ō	ō	265	0
4:45 PM	0	0	0	0	123	13	11	0	8	6	94	0	Ö	0	ő	1	255	1
4:50 PM	0	0	0	0	146	11	3	0	12	12	117	ō	0	ō	0	ó	301	0
4:55 PM	0	0	0	0	121	13	6	0	16	9	99	ō	٥	0	0	o	264	0
5:00 PM	0	o	o	0	124	7	11	0	13	11	107	0	١٥	0	0	2	273	2
5:05 PM	l o	0	0	٥	134	6	6	0	13	9	116	0	0	0	0	0	284	0
5:10 PM	o	0	Ö	0	144	7	10	0	11	8	133	0	0	0	0	0	313	0
5:15 PM	0	0	0	0	132	10	11	0	13	5	110	0	0	0	0	3	281	3
5:20 PM	0	0	0	0	125	10	4	0	5	12	91	0	0	0	0	0	247	0
5:25 PM	0	0	o	0	142	13	7	0	8	3	101	0	0	0	0	0	274	0
5:30 PM	0	0	0	0	130	5	6	0	10	5	86	0	0	0	0	0	242	0
5:35 PM	0	0	0	0	113	10	4	0	7	8	103	0	0	0	0	0	242	0
5:40 PM	0	0	0	0	135	20	2	0	9	6			_					
5:45 PM	0	0	0	0	109	5	4	0	13	3	108	0	0	0	0	1	280	1
5:50 PM	0	0	0	0	131	6		0	6	9	99	0	0	0	0	0	233	0
5:55 PM	0	0	0	0	121	6	3	0	7	4	95	0	0	0	0	0	251	0
5.55 PW	"	U	U	"	121	ь	3	U	,	4	83	0	0	0	0	0	224	0
		,																
HOURLY TOTALS	S	outhbou	nd	N	/estbour	d	N	orthbou	nd	E	astboun	d	Pe	destrians	By Appro	ach	TO	TAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	North	East	South	West	Veh	Pe
4:00 PM	0	0	0	0	1437	113	73	0	127	93	1298	0	0	0	0	5	3141	5
4:15 PM	0	0	0	0	1519	113	75	0	124	95	1329	0	0	0	0	5	3255	5
4:30 PM	0	0	0	0	1565	118	82	0	126	94	1304	0	0	0	0	6	3289	6
4:45 PM	0	0	0	0	1569	125	81	0	125	94	1265	0	0	0	0	7	3259	7
5:00 PM	0	0	0	0	1540	105	72	0	115	83	1232	0	0	0	0	6	3147	e
·····							<u></u>			<u>L.</u>							1/	



Version 3.1

INTERSECTION: North 4th Avenue-From North/W Baseline Street-From East START TIME: 4:00 PM PROJECT ID#: 7059 END TIME: 6:00 PM QC JOB #: 10086009 DATE: 3/31/2005 PEAK HOUR TURNING MOVEMENTS PEAK HOUR LINK VOLUMES 167 16285 SW 85th Avenue, Ste. 105 ¥ Tigard, OR 97224 66 Phone: 503-620-4242 Fax: 503 620-4545 ______ 21 0 0 email: jrw@qualitycounts.net PHF TOTAL www.qualitycounts.net 0.93 1801 HV = 3% 1368 → HV = 0% PEAK HOUR PED 95 1484 → 1489 ---CROSSING VOLUMES % 150 PEAK HOUR: 4:15 PM PEAK 15 MINUTES: 5:00 PM то TO 5:15 PM 5:15 PM

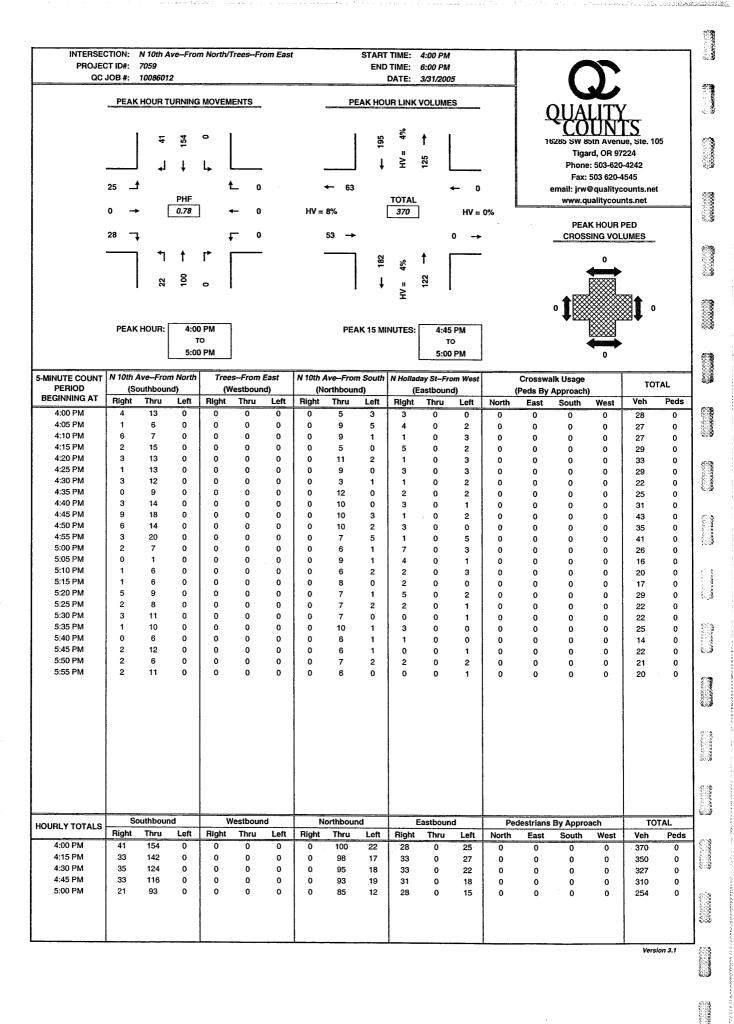
										,								
5-MINUTE COUNT	North 4th	AvenueFi	om North	W Baselin	e Street-F	rom East	North 4th	Avenue-Fr	om South	W Baselin	e Street-Fi	rom West		Crosswa	ilk Usage		TO	ΓAL
PERIOD	(Sc	outhbour	nd)	(W	estboun	d)	(No	orthbour	ıd)	(E	astbound	d)	. (Peds By	Approach))	10	IAL
BEGINNING AT	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	North	East	South	West	Veh	Peds
4:00 PM	0	6	3	0	0	0	8	3	0	3	103	0	0	0	0	0	126	0
4:05 PM	0	7	3	0	0	0	5	5	0	5	118	3	0	0	0	0	146	0
4:10 PM	0	8	1	0	0	0	9	3	0	9	104	6	0	0	0	1	140	1
4:15 PM	0	10	4	0	0	0	10	7	0	7	93	1	1	0	0	0	132	1
4:20 PM	0	10	5	0	0	0	10	5	0	8	111	1	1	0	1	2	150	4
4:25 PM	0	5	4	0	0	0	2	4	0	9	116	2	0	0	0	0	142	0
4:30 PM	0	11	5	0	0	0	9	4	0	4	117	3	0	0	0	0	153	0
4:35 PM	l o	12	4	0	0	0	3	6	0	6	97	4	0	0	1	0	132	1
4:40 PM	0	13	2	0	0	0	2	10	0	7	137	1	0	0	0	0	172	0
4:45 PM	0	6	6	0	0	0	5	8	0	5	115	1	o	0	Ö	0	146	0
4:50 PM	0	11	10	0	0	0	3	2	0	12	116	4	o	0	0	0	158	0
4:55 PM	0	7	1	0	0	ō	7	7	ō	7	104	1	0	0	1	ō	134	1
5:00 PM	0	9	1	0	ō	0	5	8	o	11	129	2	0	0	0	0	165	Ö
5:05 PM	o	10	5	ő	ō	ō	10	12	Ö	11	101	1	0	0	0	0	150	0
5:10 PM	0	14	2	ő	0	0	6	5	Ö	8	132	0	0	0	1	0	167	1
5:15 PM	o	11	2	o	o	0	13	4	0	8	111	2	0	0	0	0	151	0
5:20 PM	ő	9	2	0	0	0	5	3	0	8	109	0	0	0	0	0	136	0
5:25 PM	o	13	4	0	o	0	7	4	0	6	100	2	0	0	3	0	136	3
5:30 PM	ő	15	3	0	o	0	8	4	0	6	90	1	1	0	0	0	127	1
5:35 PM	0	9	3	0	0	0	6	4	0	9	111	0	'	0	0	0	142	0
5:40 PM	0	10	4	0	0	0	6	6	0	6	87	1	0	0	0	0	120	0
5:45 PM	ő	8	3	١٥	0	0	5	4	0	8	100	2	0			0	130	0
5:50 PM	0	10	0	0	0	0	3	10	0	6		0	0	0	0	0		0
5:55 PM	0	12	1	0	0	0	4	1	0	6	111 90	2	0	0	0	0	140 116	0
														•	-	-		
HOURLY TOTALS		outhbour Thru			estboun			orthbou			astboun				By Appro			TAL
4:00 014	Right	7.80 E	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	North	East	South	West	Veh	Ped
4:00 PM	0	106	48	0	0	0	73	64	0	82	1331	27	2	0	3	3	1731	8
4:15 PM	0	118	49	0	0	0	72	78	0	95	1368	21	2	0.	4	2	1801	8
4:30 PM	0	126	44	0	0	0	75	73	0	93	1368	21	0	0	6	0	1800	6
4:45 PM	0	124	43	0	0	0	81	67	0	97	1305	15	1	0	5	0	1732	6
5:00 PM	0	130	30	0	0	0	78	65	0	93	1271	13	1	0	4	0	1680	5
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Version 3.1

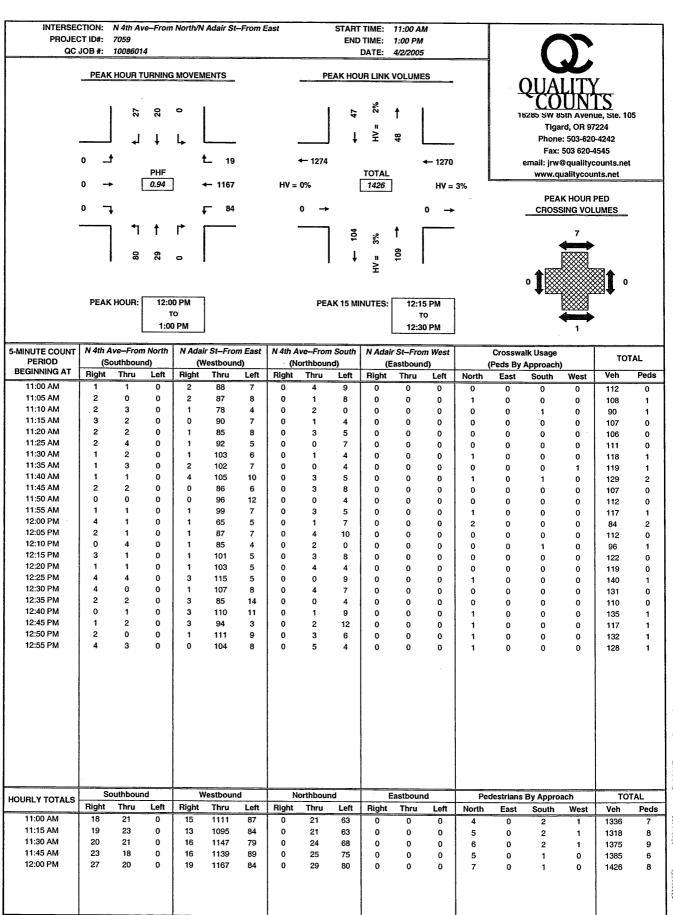
INTERSECTION: N 10th Ave-From North/W Baseline St-From East START TIME: 4:00 PM PROJECT ID#: 7059 END TIME: 6:00 PM QC JOB #: 10086011 DATE: 3/31/2005 PEAK HOUR TURNING MOVEMENTS PEAK HOUR LINK VOLUMES t 201 294 **"** Tigard, OR 97224 Phone: 503-620-4242 Fax: 503 620-4545 0 email: jrw@qualitycounts.net PHF TOTAL www.qualitycounts.net HV = 2% 2018 1337 → 0.97 HV = 0% PEAK HOUR PED 77 7 1508 → 1521 → CROSSING VOLUMES % PEAK HOUR: 4:30 PM PEAK 15 MINUTES: 4:45 PM то то 5:30 PM 5:00 PM

5-MINUTE COUNT	N 10th /			1			N 10th A			l	ine StFr				alk Usage		TO	TAL.
PERIOD BEGINNING AT		outhbou		- `	estboun/		· · ·	orthbour		<u> </u>	astboun			<u>. </u>	Approach			
·	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	North	East	South	West	Veh	Peds
4:00 PM	0	13	7	0	0	0	9	9	0	3	106	9	0	. 0	0	0	156	0
4:05 PM	0	16	10	0	0	0	8	7	0	7	102	8	0	0	0	0	158	0
4:10 PM	0	14	8	0	0	0	11	5	0	6	110	6	0	0	2	0	160	2
4:15 PM	0	14	7	0	0	0	9	4	0	8	97	6	0	1	0	0	145	1
4:20 PM	0	18	8	0	0	0	12	13	0	5	91	7	0	0	0	0	154	0
4:25 PM	0	19	4	0	0	0	7	5	0	4	107	6	1	0	0	0	152	1
4:30 PM 4:35 PM	0	25 13	6 7	0	0	0	4 7	8	0	6	121	8	0	0	0	0	178	0
4:40 PM	0	13	12	0			7	8	0	7	97	5	0	0	0	0	144	0
4:45 PM	0	17	12 8	0	0	0	5	18	0	7	122	8	0	0	0	3	185	3
4:45 PM 4:50 PM	0			1	0	0 0	12 7	11	0	11	108	8	2	0	1	0	175	3
		15	10	0	0		1	7	0	6	129	8	0	0	0	0	182	0
4:55 PM 5:00 PM	0	20 21	11 5	0	0	0	11	8	0	6	99	9	0	0	0	0	164	0
5:00 PM 5:05 PM	0	21 17	5 4	0	0 0	0 0	8	8	0	3	112	6	0	0	0	0	163	0
5:05 PM 5:10 PM	0	17	4 13	0	0	0	5 8	10 17	0	3	115	12	0	0	0	0	166	0
5:10 PM 5:15 PM	0	13	13 5	0	0	0	8	17	0	5	118	5	1	0	0	2	184	3
5:15 PM 5:20 PM	0	8	5 4	0	0	0	9	10 12	0	10	104 103	13 7	0	0	1	2	163	3 0
5:25 PM	0	o 21	8	0	0	0	7	8	0	4		, 5	0	0	0	-	152	0
5:30 PM	0	21	3	0	0	0	8	10	0	5	109	-	0	0	0	0	162	0
5:35 PM	0	12	11	0	0	0	7	4	0	2	80 98	4 9	0	0	0 3	0	131 143	3
5:40 PM	0	19	6	0	0	0	9	11	0	5		8	0	-	-	0		0
5:45 PM	0	16	4	0	0	0	9	14	0	4	91 100	3	0	0	0 0	0	149 150	0
5:50 PM	0	22	5	0	0	0	4	9	0	7	100	8	0	0		0	158	0
5:55 PM	0	13	3	0	0	0	10	9	0	7	90	5	0	0	0 2	0	137	2
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HOURLY TOTALS	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	North	East	South	West	Veh	Peds
4:00 PM	0	197	98	0	0	0	102	103	0	76	1289	88	3	1	3	3	1953	10
4:15 PM	0	210	95	0	0	0	95	117	0	71	1316	88	4	. 1	1	5	1992	11
4:30 PM	0	201	93	0	0	0	91	125	0	77	1337	94	3	0	2	7	2018	12
4:45 PM	0	202	88	0	0	0	99	116	ō	69	1266	94	3	ō	5	4	1934	12
5:00 PM	0	201	71	0	0	0	92	122	0	64	1223	85	1	ō	6	4	1858	11
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INTERSECTION: Grass Area-From North/Pacific Ave-From East START TIME: 11:00 AM PROJECT ID#: 7059 END TIME: 1:00 PM QC JOB #: 10086013 DATE: 4/2/2005 PEAK HOUR TURNING MOVEMENTS PEAK HOUR LINK VOLUMES % Tigard, OR 97224 = } Phone: 503-620-4242 Fax: 503 620-4545 0 0 **←** 1272 **←** 1280 email: jrw@qualitycounts.net PHF TOTAL www.qualitycounts.net 2793 0.91 ← 1208 HV = 3% HV = 3% 1306 → PEAK HOUR PED 72 1345 → 1410 → CROSSING VOLUMES 39 % PEAK HOUR: 12:00 PM PEAK 15 MINUTES: 12:30 PM то то 1:00 PM 12:45 PM

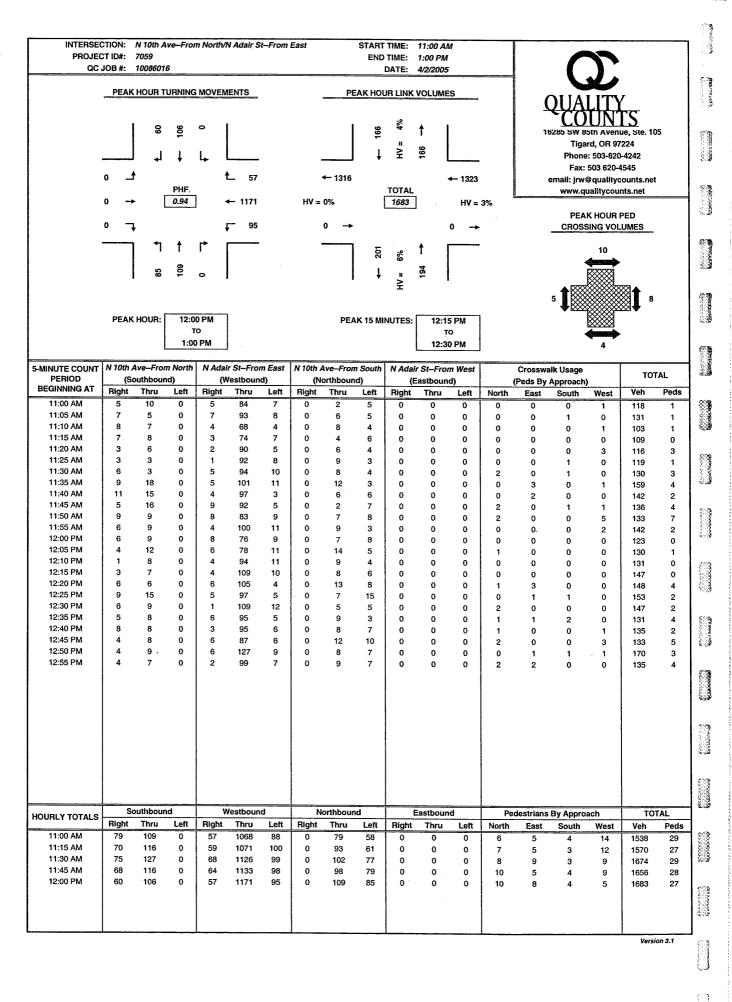
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5-MINUTE COUNT		rea-Fro			AveFro		ł	Ln-Fron			AveFro				alk Usage		TOT	AL
PERIOD BEGINNING AT		outhbou	<u>'</u>	·····	estboun			orthboun		<u> </u>	astboun			·	Approach)		Veh	Peds
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11:00 AM 11:05 AM	0	0 0	0	0	75 95	11 3	3	0	3 7	3 6	110 101	0	0	0	0 0	0	215	0
11:10 AM	0	0	0	0	95 81	2	0	0	5	2	100	0	1	0	0	ő	190	1
11:15 AM	0	0	0	0	82	7	0	0	2	5	113	0	o	0	0	0	209	0
11:20 AM	0	0	0	0	85	3	4	0	0	4	97	0	0	0	0	ő	193	0
11:25 AM	0	0	0	0	94	4	2	0	6	3	99	0	0	0.	0	0	208	0
11:30 AM	0	Ö	0	0	97	4	6	0	6	2	124	0	0	0	0	ő	239	0
11:35 AM	0	Ö	0	0	88	4	5	ō	4	4	90	0	1	0	0	ő	195	1
11:40 AM	ŏ	0	Ö	0	112	2	3	0	5	5	91	0	0	0	0	ő	218	. 0
11:45 AM	0	Ö	ō	0	100	4	2	0	3	2	113	0	١٥	ő	0	3	224	3
11:50 AM	0	ō	o	0	83	5	4	0	4	4	104	0	o	ō	0	0	204	0
11:55 AM	0	0	0	0	91	2	3	0	5	4	89	0	1	0	ō	2	194	3
12:00 PM	0	0	ō	ō	92	3	9	0	6	3	127	ō	0	0	0	1	240	1
12:05 PM	0	0	0	0	85	3	6	0	6	2	102	0	o	0	0	0	204	0
12:10 PM	0	0	0	0	78	6	5	0	10	1	87	0	1	0	3	0	187	4
12:15 PM	0	0	0	0	101	11	5	0	3	5	107	0	0	0	0	0	232	0
12:20 PM	0	. 0	0	0	112	4	11	0	4	0	109	0	0	0	0	0	240	0
12:25 PM	0	0	0	0	115	9	19	0	7	2	86	0	0	0	0	0	238	0
12:30 PM	0	0	0	0	107	3	16	. 0	6	2	142	0	0	0	0	1	276	1
12:35 PM	0	0	0	0	93	7	7	0	3	6	109	0	2	0	0	2	225	4
12:40 PM	0	0	0	0	111	5	13	0	8	5	127	0	1	0	2	0	269	3
12:45 PM	0	0	0	0	93	5	7	0	5	2	102	0	2	0	0	0	214	2
12:50 PM	0	0	0	0	113	6	1	0	3	5	107	0	1	0	1	2	235	4
12:55 PM	0	0	0	0	108	10	5	0	3	6	101	0	1	0	0	0	233	1
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11:00 AM	0	0	0	0	1083	51	36	0	50	44	1231	0	3	0	0	5	2495	8
11:15 AM	0	0	0	0	1087	47	49	0	57	39	1236	0	3	0	3	6	2515	12
11:30 AM	0	0	0	0	1154	57	78	0	63	34	1229	0	3	0	3	6	2615	12
11:45 AM	0	0	0	0	1168	62	100	0	65	36	1302	0	5	0	5	9	2733	19
12:00 PM	0	.0	0	0	1208	72	104	0	64	39	1306	0	8	0	6	6	2793	20
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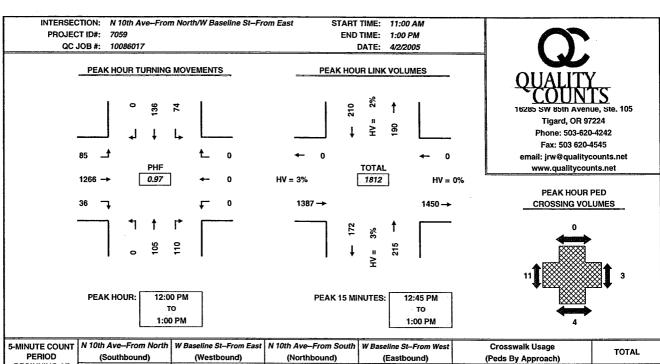


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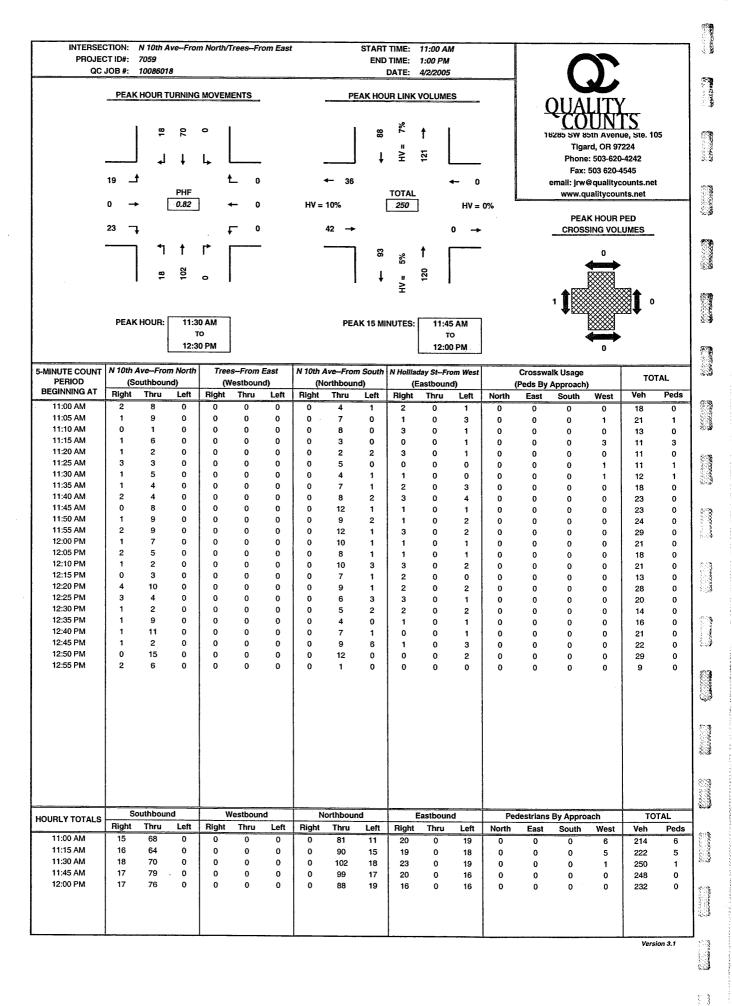
INTERSECTION: N 4th Ave--From North/W Baseline St--From East START TIME: 11:00 AM PROJECT ID#: 7059 END TIME: 1:00 PM QC JOB #: 10086015 DATE: 4/2/2005 PEAK HOUR TURNING MOVEMENTS PEAK HOUR LINK VOLUMES 106 t Tigard, OR 97224 ¥ Phone: 503-620-4242 Fax: 503 620-4545 0 40 0 email: jrw@qualitycounts.net PHF TOTAL www.qualitycounts.net 1319 -> 0.95 HV = 3% 1672 HV = 0% PEAK HOUR PED 75 1434 → 1416 → CROSSING VOLUMES 3% PEAK HOUR: 12:00 PM PEAK 15 MINUTES: 12:30 PM то то 1:00 PM 12:45 PM

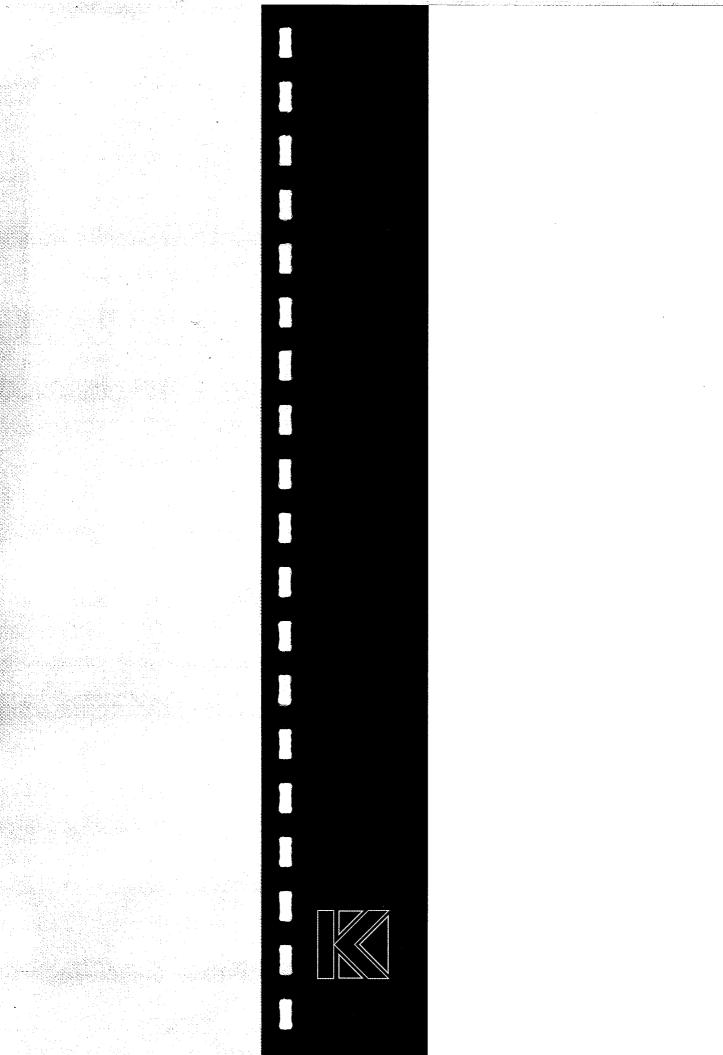
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5-MINUTE COUNT	N 4th A	veFron	n North	W Baseli	ne St-Fr	om East	N 4th A	veFrom	South	W Baseli	ne St–Fro	om West		Crosswa	ik Usage	-	TOI	FAI
PERIOD	(Sc	outhbour	nd)	(W	estboun	d)	(No	orthboun	d)	(E	astboun	d)	(1	Peds By	Approach)	l	101	AL
BEGINNING AT	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	North	East	South	West	Veh	Peds
11:00 AM	0	3	7	0	0	0	9	8	0	4	92	5	0	0	0	0	128	0
11:05 AM	0	5	3	0	0	0	4	6	0	5	108	4	0	0	0	0	135	0
11:10 AM	0	2	3	0	0	0	5	0	0	3	111	2	0	0	0	0	126	0
11:15 AM	0	4	7	0	0	0	7	5	0	4	87	3	0	0	0	0	117	0
11:20 AM	0	4	6	0	0	0	2	5	0	7	104	3	1	0	0	0	131	1
11:25 AM	0	. 2	5	0	0	0	11	2	0	5	99	1	1	0	0	0	125	1
11:30 AM	0	6	1	0	0	0	4	3	0	6	114	2	1 .	0	0	0	136	1
11:35 AM	-0	8	4	0	0	0	4	4	0	5	96	1	0	0	0	1	122	1
11:40 AM	0	5	6	0	0	0	.4	4	0	11	93	3	1	0	0	0	126	1
11:45 AM	0	5	3	0	0	0	5	8	0	5	121	3	0	0	2	0	150	2
11:50 AM	0	7	7	0	0	0	9	3	0	3	91	2	0	0	0	0	122	0
11:55 AM	0	5	3	0	0	0	5	5	0	6	108	1	0	0	3	0	133	3
12:00 PM	0	3	1	0	0	0	5	8	0	2	102	1	0	0	2	0	122	2
12:05 PM	0	7	3	0	0	0	5	7	0	7	95	8	0	0	0	0	132	0
12:10 PM	0	5	3	0	0	0	7	1	0	4	90	2	0	0	1	0	112	1
12:15 PM	0	5	1	0	0	0	7	6	0	7	106	4	٥	0	2	0	136	2
12:20 PM	0	4	2	0	0	0	8	4	0	9	114	4	٥	0	0	0	145	0
12:25 PM	0	7	3	0	0	0	8	10	0	10	112	1	0	0	0	0	151	0
12:30 PM	l o	3	4	0	0	0	5	6	0	2	119	4	o	0	0	1	143	1
12:35 PM	ا ه	6	8	0	0	0	1	4	0	11	121	0	o	0	Ö	0	151	Ö
12:40 PM	0	6	4	0	0	0	1	7	0	5	120	2	٥	0	2	0	145	2
12:45 PM	0	5	5	0	0	0	6	9	ō	5	116	4	o	0	0.	0	150	0
12:50 PM	0	11	0	0	0	ō	1	5	Ö	8	106	4	0	Ö	1	0	135	1
12:55 PM	0	8	2	١٠	ō	ō	7	4	0	5	118	6	0	0	0	0	150	0
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11:00 AM	Right 0	Thru 56	Left 55	Right	Thru 0	Left 0	Right	Thru	Left	Right	Thru	Left	North	East	South	West	Veh	Peds
11:15 AM	0	61	49	0	0	0	69 68	53 55	0	64	1224	30	4	0	5	1	1551	10
				i i				55	0	65	1200	30	4	0	8	1	1528	13
11:30 AM	0	67	37	0	0	0	71	63	0	75	1242	32	2	0	10	1	1587	13
11:45 AM	0	63	42	0	0	0	66	69	0	71	1299	32	0	0	12	1	1642	13
12:00 PM	0	70	36	0	0	0	61	71	0	75	1319	40	0	0	8	1	1672	9
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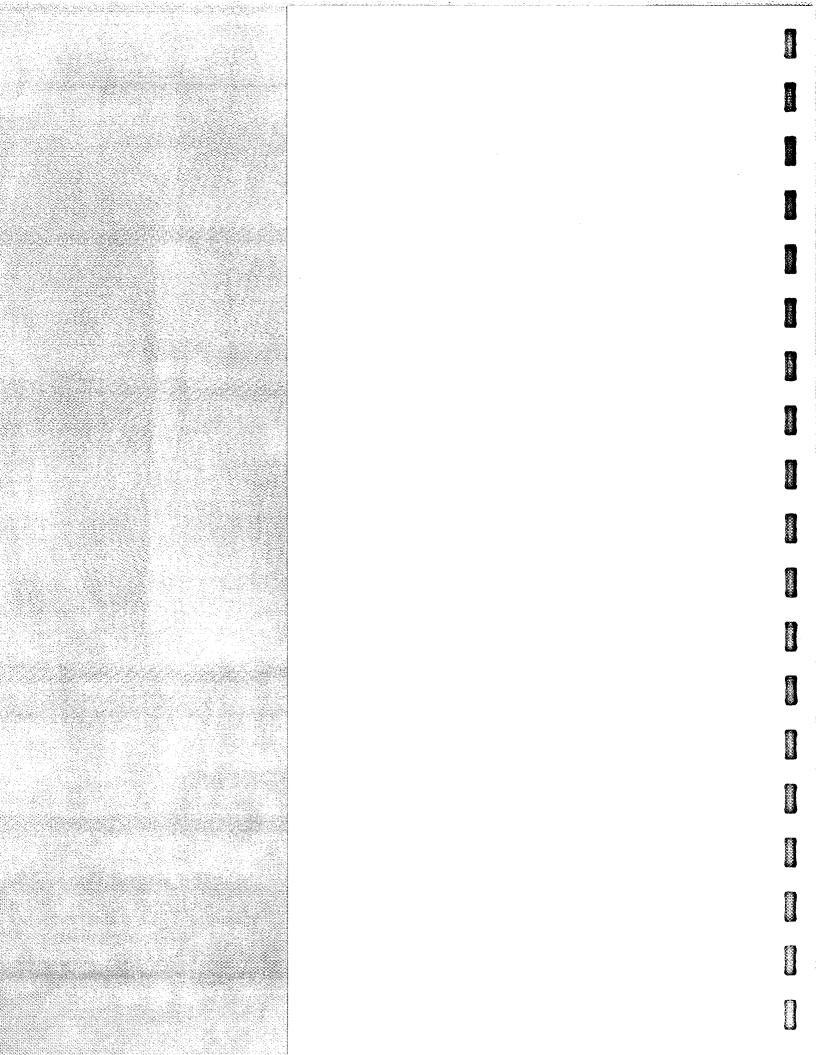




5-MINUTE COUNT PERIOD		Ave-Froi		i .				AveFron		1	ine St-Fre				alk Usage		то	ΓAL
BEGINNING AT	Right	Outnbour Thru	Left	Right	estboun Thru	Left	Right	orthboun Thru	Left	Right	astboun Thru	d) Left	North (Peds By East	Approach South	West	Veh	Peds
11:00 AM	0	10	1	0	0	0	10	4	0	3	106	5	0	0	0	7	139	7
11:05 AM	ŏ	10	8	0	0	0	11	10	0	1	106	3	1	0	1	2	149	4
11:10 AM	0	2	7	0	ō	0	7	6	0	1	105	8	, ,	0	0	0	136	ō
11:15 AM	0	7	9	ا ا	0	0	9	4	0	6	109	4	ŏ	0	0	o	148	0
11:20 AM	0	4	5	0	0	0	9	6	0	7	92	2	1	Ö	0	1	125	2
11:25 AM	0	13	1	0	0	0	7	6	0	4	97	8	o	0	0	o l	136	0
11:30 AM	0	10	1	0	0	0	11	4	0	3	105	7	1	ō	0	1	141	2
11:35 AM	0	11	14	0	0	0	0	4	0	2	104	9	3	1	Ö	4	144	8
11:40 AM	0	10	17	0	0	0	9	5	0	2	77	8	4	3	ō	3	128	10
11:45 AM	0	9	12	0	0	0	13	3	0	4	103	7	0	ō	ō	4	151	4
11:50 AM	0	13	4	0	0	0	5	7	0	2	117	5	0	Ö	2	0	153	2
11:55 AM	0	12	8	0	0	0	14	2	0	6	107	10	0	0	0	0	159	0
12:00 PM	0	18	5	0	0	0	8	11	0	5	87	6	ō	1	0	ō	140	1
12:05 PM	0	15	7	0	0	0	7	7	0	2	110	12	0	0	Ö	ō	160	0
12:10 PM	0	13	3	0	0	0	13	4	0	2	105	4	0	1	0	1	144	2
12:15 PM	0	11	8	0	0	0	10	8	0	0	82	9	0	0	1	2	128	3
12:20 PM	0	8	5	0	0	0	10	14	0	5	104	10	0	0	0	0	156	0
12:25 PM	0	12	8	0	0	0	10	7	0	2	117	6	0	0	0	1	162	1
12:30 PM	0	9	8	0	0	0	6	3	0	3	125	5	0	0	0	0	159	0
12:35 PM	0	9	7	0	0	0	7	7	0	5	111	7	0	1	0	0	153	1
12:40 PM	0	8	7	0	0	0	8	7	0	1	105	7	0	0	2	0	143	2
12:45 PM	0	10	5	0	0	0	6	11	0	2	126	10	lo	0	0	3	170	3
12:50 PM	0	14	0	0	0	0	13	8	0	3	101	4	0	0	0	4	143	4
12:55 PM	0	9	11	0	0	0	12	18	0	6	93	5	0	0	1	0	154	1
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11:00 AM	night 0	1111	87	Right 0	Thru	Left 0	Right	Thru	Left	Right	Thru	Left	North	East	South	West	Veh	Peds
	0			1	0		105	61	0	41	1228	76	10	4	3	22	1709	39
11:15 AM	1 '	135	86	0	0	0	105	63	0	45	1213	82	9	6	2	14	1729	31
11:30 AM	0	142	92	0	0	0	110	76	0	35	1218	93	8	6	3	16	1766	33
11:45 AM	0	137	82	0	0	0	111	80	0	37	1273	88	0	3	5	8	1808	16
12:00 PM	0	136	74	. 0	0	0	110	105	0	36	1266	85	0	3	4	11	1812	18
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Appendix C

Description of Level-of-Service Methods and Criteria

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Appendix C

Level of Service Concept

Level of service (LOS) is a concept developed to quantify the degree of comfort (including such elements as travel time, number of stops, total amount of stopped delay, and impediments caused by other vehicles) afforded to drivers as they travel through an intersection or roadway segment. Six grades are used to denote the various level of service from A to F.¹

Signalized Intersections

The six level of service grades are described qualitatively for signalized intersections in Table C1. Additionally, Table C2 identifies the relationship between level of service and average control delay per vehicle. Control delay is defined to include initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. Using this definition, level of service D is generally considered to represent the minimum acceptable design standard.

Table C1
Level of Service Definitions (Signalized Intersections)

Level of Service	Average Delay per Vehicle
Α	Very low average control delay, less than 10 seconds per vehicle. This occurs when progression is extremely favorable, and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.
В	Average control delay is greater than 10 seconds per vehicle and less than or equal to 20 seconds per vehicle. This generally occurs with good progression and/or short cycle lengths. More vehicles stop than for a level of service A, causing higher levels of average delay.
С	Average control delay is greater than 20 seconds per vehicle and less than or equal to 35 seconds per vehicle. These higher delays may result from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.
D	Average control delay is greater than 35 seconds per vehicle and less than or equal to 55 seconds per vehicle. The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle length, or high volume/capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	Average control delay is greater than 55 seconds per vehicle and less than or equal to 80 seconds per vehicle. This is usually considered to be the limit of acceptable delay. These high delay values generally (but not always) indicate poor progression, long cycle lengths, and high volume/capacity ratios. Individual cycle failures are frequent occurrences.
F	Average control delay is in excess of 80 seconds per vehicle. This is considered to be unacceptable to most drivers. This condition often occurs with oversaturation. It may also occur at high volume/capacity ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also contribute to such high delay values.

1 Most of the material in this appendix is adapted from the Transportation Research Board, *Highway Capacity Manual*, (2000).

Table C2
Level of Service Criteria for Signalized Intersections

Level of Service	Average Control Delay per Vehicle (Seconds)
Α	<10.0
В	>10 and ≤20
С	>20 and ≤35
D	>35 and ≤55
Е	>55 and ≤80
F	>80

Unsignalized Intersections

Unsignalized intersections include two way stop controlled (TWSC) and all way stop controlled (AWSC) intersections. The 2000 Highway Capacity Manual provides models for estimating control delay at both TWSC and AWSC intersections. A qualitative description of the various service levels associated with an unsignalized intersection is presented in Table C3. A quantitative definition of level of service for unsignalized intersections is presented in Table C4. Using this definition, level of service E is generally considered to represent the minimum acceptable design standard.

Table C3
Level of Service Criteria for Unsignalized Intersections

Level of Service	Average Delay per Vehicle to Minor Street
А	Nearly all drivers find freedom of operation.
	 Very seldom is there more than one vehicle in queue.
В	Some drivers begin to consider the delay an inconvenience.
	 Occasionally there is more than one vehicle in queue.
С	Many times there is more than one vehicle in queue.
	 Most drivers feel restricted, but not objectionably so.
Ь	Often there is more than one vehicle in queue.
	Drivers feel quite restricted.
E	 Represents a condition in which the demand is near or equal to the probable maximum number of vehicles that can be accommodated by the movement.
_	There is almost always more than one vehicle in queue.
	 Drivers find the delays approaching intolerable levels.
	Forced flow.
F	 Represents an intersection failure condition that is caused by geometric and/or operational constraints external to the intersection.

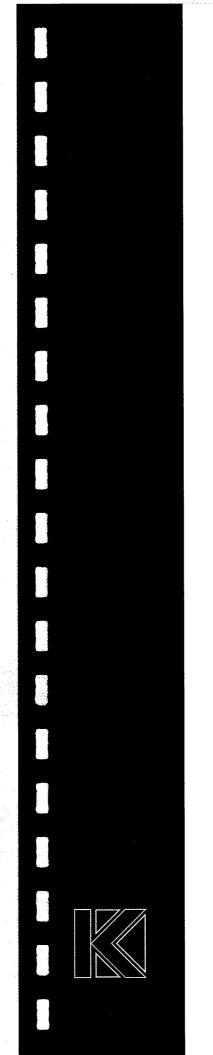
Table C4
Level of Service Criteria for Unsignalized Intersections

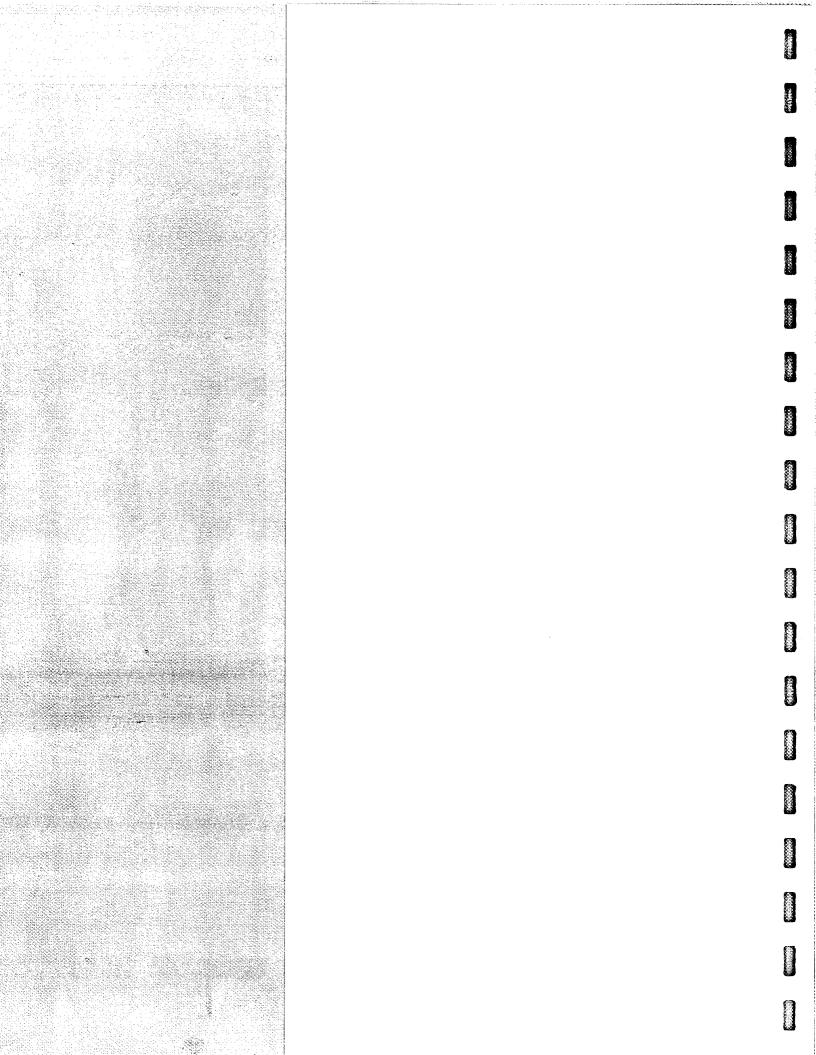
Level of Service	Average Control Delay per Vehicle (Seconds)
Α	<10.0
В	>10.0 and ≤ 15.0
С	>15,0 and ≤ 25.0
D	>25.0 and ≤ 35.0
Е	>35.0 and ≤ 50.0
F	>50.0

It should be noted that the level of service criteria for unsignalized intersections are somewhat different than the criteria used for signalized intersections. The primary reason for this difference is that drivers expect different levels of performance from different kinds of transportation facilities. The expectation is that a signalized intersection is designed to carry higher traffic volumes than an unsignalized intersection. Additionally, there are a number of driver behavior considerations that combine to make delays at signalized intersections less onerous than at unsignalized intersections. For example, drivers at signalized intersections are able to relax during the red interval, while drivers on the minor street approaches to TWSC intersections must remain attentive to the task of identifying acceptable gaps and vehicle conflicts. Also, there is often much more variability in the amount of delay experienced by individual drivers at unsignalized intersections than signalized intersections. For these reasons, it is considered that the control delay threshold for any given level of service is less for an unsignalized intersection than for a signalized intersection. While overall intersection level of service is calculated for AWSC intersections, level of service is only calculated for the minor approaches and the major street left turn movements at TWSC intersections. No delay is assumed to the major street through movements. For TWSC intersections, the overall intersection level of service remains undefined: levelof-service is only calculated for each minor street lane.

In the performance evaluation of TWSC intersections, it is important to consider other measures of effectiveness (MOE's) in addition to delay, such as v/c ratios for individual movements, average queue lengths, and 95th-percentile queue lengths. By focusing on a single MOE for the worst movement only, such as delay for the minor-street left turn, users may make inappropriate traffic control decisions. The potential for making such inappropriate decisions is likely to be particularly pronounced when the HCM level-of-service thresholds are adopted as legal standards, as is the case in many public agencies.

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Appendix D

Existing Conditions Levelof-Service Worksheets

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			# 11 Pacific Ave/Quince St	c 32.9 0.675	c 32.9 0.675	4 0.000 b/v
			# 15 W Basline St/N Yew St	c 22.3 0.000	c 22.3 0.000	4 0.000 b/v
			# 24 N Adair St/N Yew St	c 23.6 0.000	c 23.6 0.000	1 0.000 b/v
			# 52 S 4th Ave/S Heather St	A 7.3 0.046	A 7.3 0.046	+ 0.000 V/c
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			# 6 N Holladay St/10th Ave	B 10.8 0.000	в 10.8 0.000	v/d 000.0 +
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			# 15 W Basline St/N Yew St	F 52.1 0.000	F 52.1 0.000	√d 000°0 ÷
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			# 52 S 4th Ave/S Heather St	A 7.4 0.106	A 7.4 0.106	+ 0.000 V/c
			# 53 S 10th Ave/Dogwood St	B 12.4 0.000	B 12.4 0.000	+ 0.000 b/v
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Page 5-1	native) ************************************	0.680 13.9	West Bound L T R Permitted Include 0 0 0 0	00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
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expm Kittelson & Associates, Inc Project # 7059 Cornelius Wal-Mart Cornelius, Oregon Existing Traffic Conditions Weekday PM Peak Hour	Level Of Service Computation Report ***********************************	### Approach:	Traffix 7.7.1115 (c) 2004 Dowling Assoc. Licensed to KITTELSON, PORTLAND 7059EXPM.QUT 8-23-105 2:21p

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PHF Volume: Reduct Vol: Final Vol.:	2,0 2,0 1,0 1,0 1,0 1,0 1,0 1,0 1,0 1,0 1,0 1	000		000	;			User Adj: PHF Adj:			1.00 0.88 0.5	1.00 1.00 0.88 0.88 10 59	70.88 20.08 30.88 30.88	-0	0.88	0.88	1.00 0.88 1		1.00 0.88 0.8 32
Critical Gap Module: Critical Gp: 7.1 6 FollowUpTim: 3.5 4	Module: 7.1 6.5 xxxxx xxxxx 3.5 4.0 xxxxx xxxxx	x xxxx 6.5 x xxxx 4.0	3.3	**** **** ***** *****	XXX XXXX	4.1 x	XXXXX XXXX	Reduct Vol: Reduced Vol PCE Adj:		0.580	1.0020				0,260	0585	0-88 		
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evel Of Servicels: > topped Del:>			· ×××××		XXXXX XXX	!	XXXXX XXXX	Final Sat.: Capacity Ana Vol/Sat:	ysis	Module 0.06	_	0.11 0.11	:					:	0.05
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: :		Level Of Service Computation Report 2000 HCM Unsignalized Method (Base Volume Alternative) ************************************	Intersection #53 S 10th Ave/Dogwood St ************************************	Average Delay (sec/veh): 1.8 Worst Case Level Of Service: ************************************	Approach: Movement:	Control: Rights: Lanes:	wodul wol: h Adj: al Bse: dj: t Vol: vol:	· ~ - ·	ty Mod t Vol: Cap.: ap.: /Cap:	of Serviced Del: y Move: went: da Cap.: StpDel:x d LOS: achDel:
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Kitte Existing	Kittelson & Associates, Inc Project # 7059 Cornelius Wal-Mart Cornelius, Oregon Existing Traffic Conditions Saturday Midday Peak Hour		Kittelson & Associates, Inc Project # 7059 Cornelius Wal-Mart Cornelius, Oregon Existing Traffic Conditions Saturday Midday Peak Hour	is, Inc Pro it Cornelius is Saturday	ject # 7059 , Oregon Midday Peak Hour	
nario:	ırio Report		Impact A Level	Impact Analysis Report Level Of Service		
Command: Volume: Geometry: Impact Fee:			Intersection # 1 Pacific Ave/Mountain View Ln	Base Del/ V/ LOS Veh C B 10.3 0.613	Future Del/ V/ LOS Veh C B 10.3 0.613	Change in + 0.000 D/V
Irip Generation: Trip Distribution: Paths:	null null Default Paths Default Routes		# 2 W Baseline St/4th Ave	A 9.8 0.588	A 9.8 0.588	V/d 0000 +
Configuration:	exsa		4			4 0.000 b/v
			# 5 N Adair St/10th Ave	B 11.0 0.544	B 11.0 0.544	+ 0.000 b/v
			# 6 N Holladay St/10th Ave	A 9.6 0.000	A 9.6 0.000	4 0.000 b/v
			# 11 Pacific Ave/Quince St	c 28.2 0.670	c 28.2 0.670	+ 0.000 b/v
			# 15 W Basline St/N Yew St	D 33.2 0.000	D 33.2 0.000	+ 0.000 b/v
			# 24 N Adair St/N Yew St	E 38.9 0.000	E 38.9 0.000	+ 0.000 b/v
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	Kittelson & Associates Cornelius Wal-Mart Existing Traffic Conditions	. i	Project # Cornelius, Orego Saturday Midday	7059 on Peak Hour	Ä	Kittelson & Associates Cornelius Wal-Mart Existing Traffic Conditions	Inc.	Project # 7059 Cornelius, Oregon Saturday Midday Peak	y Hour
**************************************	Level (2000 HCM Operati ************************************	Level Of Service Comp Operations Method (Ba ************************************	Level Of Service Computation Report 2000 HCM Operations Method (Base Volume Alternative) ***********************************	Ve) ************	**************************************	Level 2000 HCM Operat ************************************	Of Service Comput ions Method (Base ************************************	Level Of Service Computation Report 2000 HCM Operations Method (Base Volume Alternative) ************************************	/e) ********
Cycle (sec): Loss Time (sec): Optimal Cycle:): (Sec): 10 (Y+R = 12 (Y+R = 49):	Crit Sec) Aver Leve	Cycle (sec): 100 Critical Vol./Cap. (X): 0.613 Loss Time (sec): 12 (Y+R = 4 sec) Average Delay (sec/veh): 10.3 Optimat Cycle:: 49	0.613	Cycle (sec): Loss Time (s	********** 70 ec): 8 (Y+R e: 36	************** Critic = 4 sec) Averag Level	**************************************	**************************************
Approach: Movement:	North Bound	South Bound	d East Bound R L - T - R	West Bound	Approach: Movement:	North Bound	South Bound	East Bound	West Bound
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9		Level Of Service Computation Report 2000 HCM Operations Method (Base Volume Alternative) ***********************************	95.A	Bound F - R	tted 1	585	0.58 0.88	:	1900 0.92 0.03 52	0.39	0.76 0.51 4.0 1.00 4.0 4.0	
Page		* *	Cycle (sec): 70 Critical Vol./Cap. (X): 0.509 Loss Time (sec): 8 (Y+R = 4 sec) Average Delay (sec/veh): 7.3 Optimal Cycle: 31 Level Of Service: A	West Bo	Permitted Include 0 0		-0-	7241 0 1.00 0 1.00 9 1241	0 1900 2 0.92 3 1.84 1 3208		5 0.76 1 0.51 2 4.0 1.00 1.00 1.00	
	k Hou	* * * * * * * * *				1.00 1.00 84	-0	80.5.8	1900 0.92 0.13 231	0.39	0.76 0.51 4.0 1.00 4.0	
	oregon Idday Pea	* * * * * * * * * * * * * * * * * * *	(X): :/veh)	Bound F - R	ted de 0 0	-00.	 0.7800	.0800	1.00	0.00	0.00	
0		Report	Vol./Cap. elay (sec. Service:	East Bo	Permitted Include 0 0 0	000	0.70	-6860	0.00	0.00	0.00	
14:21:30	Cornelius, Saturday M	Ation Volum	al Vol			1.00	0.0 0.9 0.0	980	1,000	0.00	0.00	
2005 14	Inc. Col	Level Of Service Computation Report 0 HCM Operations Method (Base Voliume Alternativ ************************************	Critical Vol./Cap. Average Delay (sec, Level Of Service:	Bound	ted lde 1 0	1.00		2992	1900 0.90 0.58 982	0.03	0.13 30.1 1.00 30.1 30.1	
23,	: . :	Service (servic	sec)	South Bo	Permitted Include 0 0 1		0.5 2.7 0.7 0.7 0.7	4000	1900 0.90 0.42 727	0.03	0.13 30.1 30.1 30.1 ****	
Tue Aug	Associates us Wal-Mart Conditions	Of Ser tions M ******	7 =	os ,	0	00.1	0.70	.0880	1900	0.00	0.00	
1	യ≍്ല	Level Of Ser HCM Operations M ************************************	(Y+R	r and .	tted	080	0.90	.0880	1900	e: 0.00	0.00	
		HCM O ******	70 8 31	North Bound	Permitted Include 0 1 0	1.0%	0.10 31 0.94	3.001	1900 0.97 1.00 1845	Modul 0.02	0.13 0.13 28.4 1.00 28.4 ****	
	st	2000 * 5 * * * * * * * * * * * * * * * * * *	ec): e:	N -		-: 868	0.00 0.94 0.95	.8888.	Ow Module 1900 1900 0.70 0.97 1.00 1.00 1332 1845	ysis 0.06 ****	0.13 0.51 39.2 1.00 39.2 3.3	
	Exi	**************************************	(sec): ime (s l_Cycl	 	l: reen:	Modul	Lume:	1 Vol.:	rion F ne: nent: Sat.:	y Ana		
exsa		200 ***********************************	Cycle (sec): Loss Time (sec): Optimal Cycle:	Approach: Movement:	Control: Rights: Min. Green: Lanes:	Volume Modul Base Vol: Growth Adj:	User Adj: PHF Adj: PHF Volume Reduct Vol	Reduced Vo PCE Adj: MLF Adj: Final Vol.	Saturation Sat/Lane: Adjustment Lanes: Final Sat.	Capacity Ana Vol/Sat: Crit Moves:	Green/Cycle Volume/Cap: Delay/Veh: User DelAdj AdjDel/Veh: HCMZKAV9:	
5-1			M O M	Bound R	ted de 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	. 00.	0.97	.0860	1900	0.00	0.00	
Page		* * * * * * * * * * * * * * * * * * *	0.613 13.0 B	lest Bo	Permitted Include 0 0 0	080	0.97	.0860	1900 1.00 0.00	00.00	0.00	
	Hour	* * *		3	0 0	- °8°	0.97	°88°	8880	0		
	. IS THE	. 4.5 1	1				_	<u>i</u>	1,00	0.00	0.00	
	# 7059 gon iy Peak	******	(X): :/veh):	und -	ited I	36 1.00 1 36 1	1.00 0.97 37		1900 19 0.82 1. 1.00 0.1	0.02 0.00	0.76 0.00 0.03 0.00 2.1 0.0 1.00 1.00 2.1 0.0 0 0	
0	oject # 705 s, Oregon Midday Pea	Report ***********************************	./Cap. (X): 0.613 y (sec/veh): 13.0 vice: B	ast Bound	. + 7	1266 1.00 1	1.00 1.00 0.97 0.97 1305 37	1305 37 1.00 1.00 1 1.00 1.00 1 1305 37	1900 1900 0.78 0.82 1.87 1.00 2792 1557	0.47 0.02	0.76 0.03 2.1 1.00 2.1 2.1	
4:21:30	Project # 705 nelius, Oregon turday Midday Pea		al Vol./Cap. (X): • Delay (sec/veh): of Service:	East Bound		85 1266 1.00 1.00 1 85 1266	1.00 1.00 0.97 0.97 1305 37	1.00 1	1900 0.82 1.00 1557	7 0.02	0.76 0.03 2.1 1.00 2.1 2.1	
:005 14:21:30	Cornelius, Ore Saturday Midda		ritical Vol./Cap. (X): .verage Delay (sec/veh): evel Of Service:	und East Bound	D 0 1 1	1266 1.00 1	1.00 1.00 1.00 0.97 0.97 0.97 88 1305 37	1305 37 1.00 1.00 1 1.00 1.00 1 1305 37	1900 1900 0.78 0.82 1.87 1.00 2792 1557	0.47 0.02	0.76 0.03 2.1 1.00 2.1 2.1	
23, 2005 14:21:30	E ;		Critical Vol./Cap. (X): sec) Average Delay (sec/veh): Level Of Service:	uth Bound East Bound	ermitted Permi Include 0 0 0	136 0 85 1266 1.00 1.00 1.00 1.00 1 136 0 85 1266	1.00 1.00 1.00 1.00 1.00 1.00 0.97 0.97 0.97 0.97 0.97 0.97 0.97 0	140 0 88 1305 37 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0	1900 1900 1900 1900 1900 0.98 1.00 0.78 0.78 0.82 1.00 0.00 0.13 1.87 1.00 1862 0 187 2792 1557	0.08 0.00 0.47 0.47 0.02	0.00 0.76 0.76 0.76 0.03 0.00 0.61 0.61 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.0	
: 1	E ;		Critical Vol./Cap. (X): = 4 sec) Average Delay (sec/veh): Level Of Service:	South Bound East Bound	d Permi	0 85 1266 1.00 1.00 1.00 1 85 1266	1.00 1.00 1.00 1.00 0.97 0.97 0.97 0.97 0 88 1305 37	140 0 88 1305 37 1.00 1.00 1.00 1.00 1.00 1 1.00 1.00 1.	1900 1900 1900 1900 1.00 0.78 0.78 0.82 0.00 0.13 1.87 1.00 0 187 2792 1557	0.00 0.47 0.47 0.02	0.00 0.76 0.76 0.76 0.03 0.00 0.61 0.61 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.0	
Tue Aug 23, 2005 14:21:30	E ;		Critical Vol./Cap. (X): (Y+R = 4 sec) Average Delay (sec/veh): Level Of Service:	und South Bound East Bound	Permitted Permi Include 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	136 0 85 1266 1.00 1.00 1.00 1.00 1 136 0 85 1266	1.00 1.00 1.00 1.00 1.00 1.00 0.97 0.97 0.97 0.97 0.97 0.97 0.97 0	76 140 0 88 1305 37 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	1900 1900 1900 1900 1900 0.98 1.00 0.78 0.78 0.82 1.00 0.00 0.13 1.87 1.00 1862 0 187 2792 1557	1.07 0.06 0.08 0.00 0.47 0.47 0.02***	0.12 0.12 0.00 0.76 0.76 0.76 0.76 0.79 0.61 0.03 39.4 40.8 0.0 4.9 4.9 2.1 1.00 1.00 1.00 1.00 1.00 1.00 39.4 40.8 0.0 4.9 4.9 2.1 3 4 0 9 4 0 9 2.1 3 4 0 9 4 0 9 2.1	
: 1	E ;		70 Critical Vol./Cap. (X): 8 (Y+R = 4 sec) Average Delay (sec/veh): 38 Level Of Service:	th Bound South Bound East Bound	Permitted Permi Include 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	105 110 74 136 0 85 1266 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	108 113 76 140 0 88 1305 37 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0	dule: 1900 1900 1900 1900 1900 1900 1900 0.97 0.82 0.67 0.98 1.00 0.78 0.78 0.82 1.00 1.00 1.00 1.00 0.00 0.13 1.87 1.00 1845 1554 1264 1862 0 187 2792 1557	Module: 0.06 0.07 0.06 0.08 0.00 0.47 0.47 0.02 ****	0.12 0.12 0.00 0.76 0.76 0.76 0.76 0.79 0.61 0.03 39.4 40.8 0.0 4.9 4.9 2.1 1.00 1.00 1.00 1.00 1.00 1.00 39.4 40.8 0.0 4.9 4.9 2.1 3 4 0 9 4 0 9 2.1 3 4 0 9 4 0 9 2.1	
: 1	E ;		cc): 8 (Y+R = 4 sec) Average Delay (sec/veh): e: 38	North Bound South Bound East Bound	Permitted Perm	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	0 108 113 76 140 0 88 1305 37 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	Ow Module: 1900 1900 1900 1900 1900 1900 1900 1900	lysis Module:	0.12 0.12 0.00 0.76 0.76 0.76 0.76 0.79 0.61 0.03 39.4 40.8 0.0 4.9 4.9 2.1 1.00 1.00 1.00 1.00 1.00 1.00 39.4 40.8 0.0 4.9 4.9 2.1 3 4 0 9 4 0 9 2.1 3 4 0 9 4 0 9 2.1	
: 1	Kittelson & Associates, Inc Project # 705 Cornelius Wal-Mart Cornelius, Oregon Existing Traffic Conditions Saturday Midday Pee		(sec): 70 Critical Vol./Cap. (X): ime (sec): 8 (Y+R = 4 sec) Average Delay (sec/veh): Cycle: 38	th: North Bound South Bound East Bound Tt: L - T - R L - T - R R	Permitted Permitted Permit Include Inc	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	0 108 113 76 140 0 88 1305 37 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	n Flow Module: 1900 1900 1900 1900 1900 1900 1900 1900	nalysis Module: 0.00 0.06 0.07 0.06 0.08 0.00 0.47 0.47 0.02 	0.12 0.12 0.00 0.76 0.76 0.76 0.76 0.79 0.61 0.03 39.4 40.8 0.0 4.9 4.9 2.1 1.00 1.00 1.00 1.00 1.00 1.00 39.4 40.8 0.0 4.9 4.9 2.1 3 4 0 9 4 0 9 2.1 3 4 0 9 4 0 9 2.1	
: 1	E ;			Approach: North Bound South Bound East Bound Movement: L - T - R L - T - R	ol: Permitted Permitted Permi s: Include Include Permi Green: 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	odule: 0 105 110 74 136 0 85 1266 dj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	ion Flow Module: e: 1900 1900 1900 1900 1900 1900 1900 190	ty Analysis Module: '!' t: 0.00 0.06 0.07 0.06 0.08 0.00 0.47 0.47 0.02 t: ****	e: 0.00 0.12 0.12 0.12 0.12 0.00 0.76 0.76 0.76 0.76 0.76 0.76 0.00 0.00	

		·			I≪14PRINT
exsa Tue Aug 23, 2005 14:21:30 Page 8-1	Kittelson & Associates, Cornelius Wal-Mart Existing Traffic Conditions	Level Of Service Computation Report ************************************	Average Delay (sec/veh): 1.9 Worst Case Level Of Service: AI 9.61 ************************************	Control:	Traffix 7.7.1115 (c) 2004 Dowling Assoc. Licensed to KITTELSON, PORTLAND
1	Kittelson & Associates, Inc Project # 7059 Cornelius Wal-Mart Cornelius, Oregon Existing Traffic Conditions Saturday Midday Peak Hour	level Of Service Computation Report ***********************************	Cycle (sec): 70 Critical Vol./Cap. (X): 0.544 Loss Time (sec): 8 (Y+R = 4 sec) Average Delay (sec/veh): 11.0 Optimal Cycle: 33	Approach: North Bound South Bound East Bound West Bound Rights: L T R L T R L T R L T R L T R L T R L T R L L T R L L T R L L T R L L T R L L T R L L T R L L T R L L T R L L T R L L T R L L L T R L L L T R L L L T R L L L T R L L L T R L L L T R L L L T R L L L T R L L L T R L L L T R L L L T R L L L T R L L L T R L L L T R L L L T R L L L T R L L L T R L L L T R L T R L T R L T R L T R L T R L T R R R L T R R R R	Traffix 7.7.1115 (c) 2004 Dowling Assoc. Licensed to KITTELSON, PORTLAND

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	Kittelson & Associates Cornelius Wal-Mart Existing Traffic Conditions	- :	Inc Pr Corneliu Saturday	ojec Is, o Mid	t # 7059 regon day Peak	Hour			Existi	Kittelson & Associates, Cornelius Wal-Mart Existing Traffic Conditions	elson & Associates Cornelius Wal-Mart Traffic Conditions	; ;	Inc Corne Sature	Project # 7059 Cornelius, Oregon Saturday Midday Peak Hour	# 7059 gon iy Peak	our.	
*******	Level Of Service Computation Repor 2000 HCM Operations Method (Base Volume Altr	of Service ations Methoc	Computat: (Base Vc *******		t ernative ******	.nt ternative) **********	****	****	2000	Le HCM Uns ******	vel Of : ignalize ******	Level Of Service Computation Report 2000 HCM Unsignalized Method (Base Volume Alternative) ************************************	Omputati (Base V	on Report	ernativ	*****	***
Intersection **********	Intersection #11 Pacific Ave/Quince St ************************************	<pre>\ve/Quince St ************************************</pre>	*****	*****	******	******************	****	Intersec	tion #15	W Basli	ne St/N *******	Intersection #15 W Basline St/N Yew St	******	*****	****	*****	****
Cycle (sec): Loss Time (sec): Optimal Cycle:	Cycle (sec): 100 Critical Vol./Cs Loss Time (sec): 16 (Y+R = 4 sec) Average Delay (s Optimal Cycle: 65	+R = 4 sec)	Critical Vol./Cap. (X): 4 sec) Average Delay (sec/veh): Level Of Service:	Vol./Cap elay (se Service:	ap. (X): sec/veh): e:	p. (X): 0.670 ec/veh): 28.2 ::	0.670 28.2 C	Average D ******* Approach:	Delay (s	sec/veh): ************************************	******	Average Delay (sec/veh): 2.2 Worst Case Level Of Service: DI 33.2] ************************************	Case L.	evel Of Serv ********* East_Bound	ervice: *******	D[33.***********************************	[33.2; ****** Bound
Approach: Movement:	North Bound	South Bound	ound R		Bound	West Bound	Bound R	Movement: Control:	<u>- </u>	Stop Sign	×	Stop Sign	×	Uncontrolled		Uncont	Uncontrolled
Control: Rights: Min. Green: Lanes:		<u></u>	ted ude 10		cted li	Protected Include	otected Include 0 0 2 0 1	Lanes:	0 40dule:	0 0 1	14) 1 0 0 1 0 0 48 15	o	·	10 - 19		0 0 0
Volume Module: Volume Module: Base Vol: Growth Adj: 1 Initial Bse: User Adj: 0	64 77 .00 1.00 64 77 .00 1.00	222 125 113 1.00 1.00 1.00 222 125 113 1.00 1.00 1.00 0.93 0.93 0.93	1.00	105 733 1.00 1.00 105 733 1.00 1.00 0.93 0.93	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	269 860 1.00 1.00 269 860 1.00 1.00 0.93 0.93	135 0 135 0 1.00 1.00 1.00 3 0.93	Growth Adj: Initial Bse User Adj: PHF Adj: PHF Volume: Reduct Vol::	0.0 0.0	1.00 1.00 0.94 0.94 18		1.00 1.00 48 15 1.00 1.00 0.94 0.94 51 16	1.00 .94 .00 .00	1.00 1.00 32 1359 1.00 1.00 0.94 0.94 34 1446 0 0 34 1446	20.00	1.00 1.00 1.00 1.00 0.94 0.94 0 0	000000000000000000000000000000000000000
PHF Volume: Reduct Vol: Reduced Vol: PCE Adj: MLF Adj: Final Vol.:	69 83 0 0 1.00 1.00 1.00 1.00 69 83	134 1.00 1.00 134	80888					Critical Gap Critical Gp: FollowUpTim: Capacity Mod	Critical Gap Module Critical Gp:xxxxx FollowUpTim:xxxxx Capacity Module:	: :	<u>-</u> -	6.5		4.1 xxxx 2.2 xxxx			XXXXX XXXX
Saturation F Sat/Lane: Adjustment: Lanes: Final Sat.:	[ow Module: 1900 1900 0.91 0.96 1.00 1.00 1.736 1828	1900 1900 1900 0.82 0.91 0.91 1.00 1.00 0.60 1554 1736 1039	1900 0.91 0.40 681	1900 1900 0.94 0.93 1.00 1.83 1787 3224	1900 0.93 0.17 303	1900 1900 0.94 0.94 1.00 2.00 1787 3574	1900 1900 1.00 1.00 1.599	Cnflict Vol: Potent Cap.: Move Cap.: Volume/Cap:	Coffict Vol: xxxx 1524 Potent Cap.: xxxx 117 Move Cap.: xxxx 0.16 Volume/Cap: xxxx 0.16 Level Of Service Module:	: ::		1534 117 112 0.14		0.04 xxxx 0 900 xxxx 900 0.04 xxxx		XXXX XXXX XXXX XXXX XXXX XXXX	
Capacity Analysis Modu Vol/Sat: 0.04 Nodu Crit Moves: **** Green/Cycle: 0.06 0.09 Volume/Cap: 0.67 0.53 Volume/Cap: 0.67 0.53 User DelAdj: 1.00 1.00 AdjDel/Veh: 61.9 47.0 AdjDel/Veh: 61.9 47.0	alysis Module: 0.04 0.05 0.05 0.05 0.06 0.53 0.47 0.67 0.70 27.4 1.00 1.00 1.00 61.9 47.0 27.4 ************************************	0.08 0.12 0.08 0.12 0.15 0.17 0.53 0.67 41.4 44.4 11.00 1.00 11.00 1.00	0.12 0.17 0.67 44.4 1.00 44.4	0.06 0.24 0.12 0.36 0.12 0.35 0.53 0.67 44,0 28,1 1.00 1.00 44,0 28,1	0.24 (0.00 (0.16 0.26 **** 0.24 0.49 0.67 0.53 38.4 18.0 1.00 1.00 38.4 18.0	5 0.09 5 0.19 7 0.19 11.00 14.6	Stopped Del: LOS by Move: Movement: Shared Cap.: SharedQueue: Shrd Stgbel: Shared LOS: ApproachDel: ApproachDel:	Se.::-:::	^^ '		XXXX XXXX XXXX XXXX D	^	9.2 xxxx A LT - LTR XXXX XXXX XXXX 0.1 xxxx 9.2 xxxx A x **	XXXXX XXXXX XXXXXX XXXXXX	XXXXX XXXX XXXX XXXX LT - LTR XXXX XXXX XXXX XXXX XXXX XXXX XXXXX XXXX XXXX XXXX	XXXXX XXXXX XXXXX XXXXX XXXXX XXXXX

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7.3 XXX XXXXX
A A * * * West Bound
L T R
-||-----------4 xxxx xxxxx 1605 xxxx xxxxx 1599 xxxx xxxxx 0.02 xxxx xxxxx 0.0 xxx xxxxx 7.3 xxx xxxxx Average Delay (sec/veh): 3.1 Worst Case Level Of Service: E[38.9] 4.1 xxxx xxxxx 2.2 xxxx xxxxx Include 0 1 0 1 0 Page 11-1 22 1208 1.00 1.00 22 1208 1.00 1.00 0.90 0.90 24 1342 0 1342 ××××× Kittelson & Associates, Inc. -- Project # 7059 Cornelius Wal-Mart -- Cornelius, Oregon Existing Traffic Conditions -- Saturday Midday Peak Hour East Bound
L - T - R 6.3 xxxx xxxx xxxx 3.4 xxxx xxxx XXXX XXXX XXXX Uncontrolled Include 0 0 0 0 1.00 1.00 1.00 0.90 0.90 0.90 ** 2005 14:21:31 2003 2003 2003 2003 2003 Stop Sign Include 0 0 0 1 0 698 434 433 0.06 South Bound shred LOS:

Shared LOS:

Shared LOS:

Shared LOS:

ApproachLOS:

Shared LOS:

ApproachLOS:

Shared LOS:

ApproachLOS:

ical Gap Module: Critical Gp: 7.1 6.5 xxxxx xxxxx 6.6 FollowUpTim: 3.5 4.0 xxxxx xxxxx 4.1 xxxx 1420 xxxx 134 xxxx 131 xxxx 0.35 Tue Aug 23, Capacity Module:
Cnflict Vol: 749 1444 xxxxx
Potent cap.: 328 132 xxxxx
Move Cap.: 222 129 xxxxx
Volume/Cap: 0.14 0.16 xxxx Stop Sign Include 0 1 0 0 0 L - T - R North Bound Base Vol: 27 19 Growth Adj: 1.00 1.00 Initial Bse: 27 19 User Adj: 0.90 0.90 PHF Adj: 0.90 0.90 PHF Volume: 30 21 Level Of Service Module: Volume Modulė: Base Vol: Reduct Vol: Final Vol.: Approach: Movement: Control: ights: _anes: exsa

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Oregon Department of Transportation

Transportation Development Branch

Transportation Planning Analysis Unit

Major Street: N. ADAIR ST.

Project: Cornelius Wal-Mart

Year: 2005 Existing

Minor Street: N. YEW ST.

City/County: Cornelius OR

Alternative: Weekday PM Peak Hour

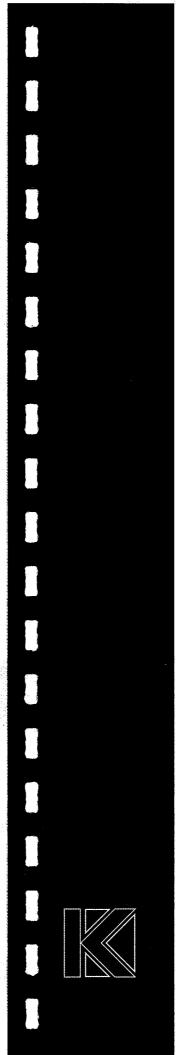
Ital.	UD EXISTI	۹	Alternative:	weekday PM	reak Hour
	Preli	minary Sign	al Warrant <mark>'</mark>	Volumes -	
Num	ber of	ADT on m	najor street	ADT on minor	r street, highest
Approa	ach lanes	approach	ning from	appro	aching
		both di	rections	vol	ume
Major	Minor	Percent of star	ndard warrants	percent of stan	dard warrants
Street	Street	100	70	100	70
	Cas	e A: Minimu	m Vehicular	Traffic	
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
	Case B:	Interruptio	n of Continu	ous Traffic	
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250
5.65% of	f the above AD	T volumes is ed	qual to the MUT	CD vehicles pe	r hour (vph)
		andard warrants			· · · · · · · · · · · · · · · · · · ·
	70 percent of sta	ındard warrants ²			
	Prelin	ninary Signa	l Warrant C	alculation	
	Street	Number of	Warrant	Approach	Warrant Met
		Lanes	Volumes	Volumes	
Case	Major	a	10,600	17,220	NO

STATE OF THE STATE OF	T. I. CHI	mary orgina	i warani C	aiculation	
	Street	Number of	Warrant	Approach	Warrant Met
		Lanes	Volumes	Volumes	
Case	Major	2	10,600	17,220	NO
A	Minor	l	2,650	1,140	7 //
Case	Major	2	15,900	17,220	NO
В	Minor		1,350	1,140	
Analyst and	d Date: CBT	8.30.05	Reviewer and	Date:	

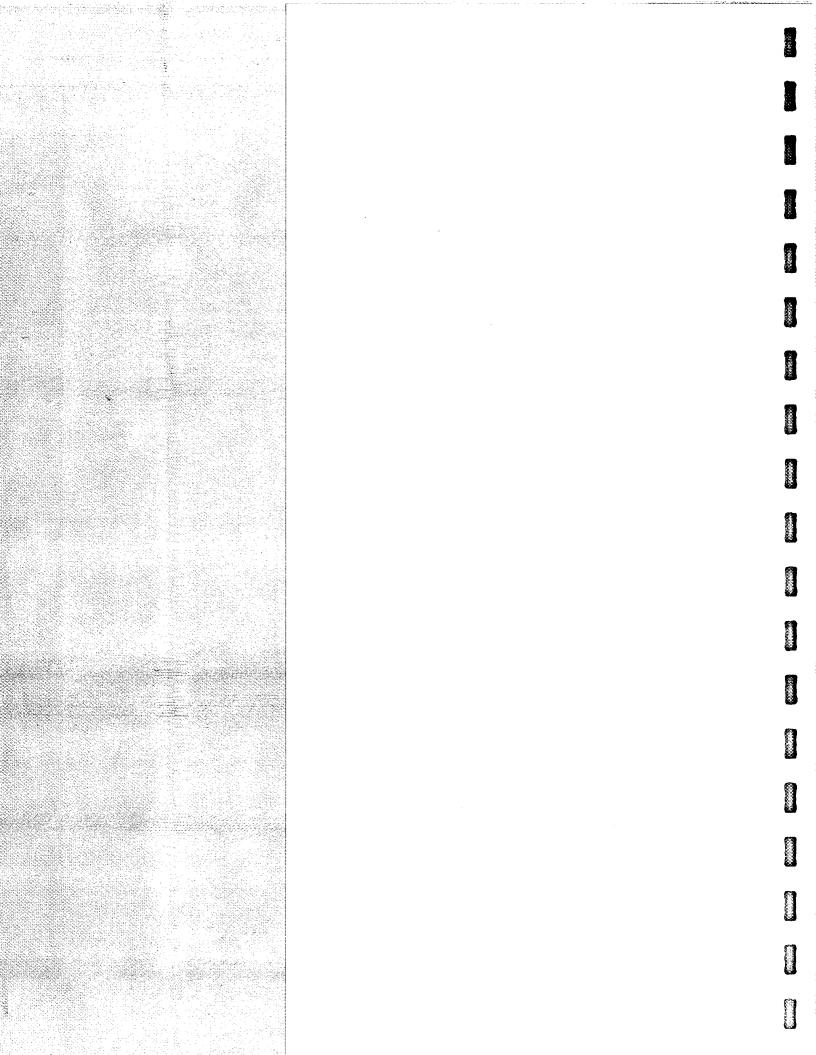
¹ Meeting preliminary signal warrants does **not** guarantee that a signal will be installed. Before a signal can be installed a traffic signal investigation must be conducted or reviewed by the Region Traffic Manager. Traffic signal warrants must be met and the State Traffic Engineer's approval obtained before a traffic signal can be installed on a state highway.

² Used due to 85th percentile speed in excess of 40 mph or isolated community with population of less than 10,000.

SCOCKED CASO Parasay. Market Const Section 1 Special Control Vicinity of V Appearance on the



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Appendix E

Crash Data

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OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT CRASH SUMMARIES BY YEAR BY COLLISION TYPE Mountain View Lane at Pacific Ave/Tualatin Valley Hwy (Rt 8, Hwy 29) in Forest Grove, not Cornelius

PAGE: 1

	TYPE	EAR: 1999	REAR-END	TURNING MOVEMENTS	999 TOTAL	EAR: 2000	REAR-END	000 TOTAL	EAR: 2001	REAR-END	001 TOTAL	EAR: 2002	TURNING MOVEMENTS	002 TOTAL	EAR: 2003	REAR-END	TURNING MOVEMENTS	003 TOTAL	FINAL TOTAL
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OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT CONTINUOUS SYSTEM CRASH LISTING

029 TUALATIN VALLEY	Mountain View	_	at Pacific	Lane at Pacific Ave/Tualatin Valley Hwy (Rt 8, Hwy 29) in 1999 - 2003	lley Hwy - 2003	Rt 8, Hwy 2) in For	est Grov	Forest Grove, not Cornelius	rnelius			
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OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION TRANSPORTATION DATA SECTION - CRASH ANSISTA AND REPORTING UNIT CONTINUOUS SYSTEM CRASH LISTING MOUNTAIN OF PACIFIC AVE/TUALATION VALUE AND 29) IN FOREST GROVE, NOT CONNELLUS

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OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT CONTINUOUS SYSTEM CRASH LISTING

CDS380 4/11/2005

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Mountain View Lane at Pacific Ave/Tualatin Valley Hwy (Rt 8, Hwy 29) in Forest Grove, not Cornelius 1999 - 2003	PRTC INJ P# TYPE SVRTY	
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8, Hwy 29) in	VEHICLE USE-TRLR OWNER V# TYPE	
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at Pacific	INT-TYP (MEDIAN) INT-REL OFFRD WTHR LEGS TRAF- RNDBT SURF (#IANES) CNTL DRWWY LIGHT	
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	COUNTY CITY URBAN AREA	
029 TUALATIN VALLEY	S D W F R S W E A U C O DATE SER#. E L G H R DAY INVEST D C S L K TIME	
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SER#. ELGH INVEST DCSL	R DAY K TIME	CITY URBAN AREA	MLG TYP MILEPNT	MLG TYP FIRST STREET MILEPNT SECOND STREET	DIRECT	LEGS TRAF- (#LANES) CNTL		RNDBT SURF DRVWY LIGHT	COLL	OWNER V# TYPE	FROM	PRTC P# TYPE	SVRTY	G E LICNS PED E X RES LOC	ERROR	ACT EVENT	CAUSE
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Contraction of the

Section Section 1979

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CDS380	

029 TUALATIN VALLEY

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT CONTINUOUS SYSTEM CRASH LISTING Mountain View Lane at Pacific Ave/Tualatin Valley Hwy (Rt 8, Hwy 29) in Forest Grove, not Cornelius 1999 - 2003

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	ERROR	000	026	000	026	000	020	000
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	ING	INGC	NONE	NONE	NONE	INGC	NONE INJB	INGC
	PRTC P# TYPE	1 DRV	1 DRV	1 DRV	1 DRV	1 DRV	1 DRV 2 PSN	
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Company Company

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT CRASH SUMMARIES BY YEAR BY COLLISION TYPE 4th Avenue at Adair Street (Rt 8, Hwy 29) in Cornelius 1999 - 2003

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	COLLISION TYPE	YEAR: 1999	ANGLE	TURNING MOVEMENTS	1999 TOTAL	YEAR: 2000	ANGLE	TURNING MOVEMENTS	2000 TOTAL	YEAR: 2001	ANGLE	REAR-END	TURNING MOVEMENTS	2001 TOTAL	YEAR: 2002	ANGLE	BACKING	2002 TOTAL	YEAR: 2003	ANGLE	TURNING MOVEMENTS	2003 TOTAL	FINAL TOTAL

I DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT CONTINUOUS SYSTEM CRASH LISTING

1 1 1 1 1 1 1 1 1 1	029 TUALATIN VALLEY			4th Aver	CUNTINGUS SIZEM CRASH LIBITING 4th Avenue at Adair Street (Rt 8, Hwy 29) in Cornellus 1999 - 2003	1 CKASH LLS (Rt 8, Hwy 2003	iing 29) in Corneliu	κį				
	D RSW AUCODATE LGHRDAY CSLKTIME	CLASS COMPAT CONN # MLG TYP FIRST MIG TYP FIRST STREET MILEPNT SECOND STREET	RD CHAR DIRECT LOCTN	INT-TYP (MEDIAN) LEGS (#LANES)	INT-REL OFFRD WTHR TRAF- RNDBT SURF CNTL DRVWY LIGHT	CRASH COLL SVRTY	VEHICLE USE-TRLR OWNER TYPE	#± Ω.	AS GELICNS EXRES	ERROR	ACT EVENT	CAUSE
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	INJ	NONE	NONE NO<5	INJC	NONE	NONE	NONE	NONE	NONE	INJA	INJC
IVISION	PRTC P# TYPE	1 DRV	1 DRV 2 PSN	·	1 DRV	1 DRV	1 DRV	1 DRV	1 DRV	1 DRV	1 DRV 2 PSN
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- TRANSPOR CRASH ANAI CRASH LI	CRASH COLL SVRTY	ANGL-OT TURN PDO		ANGL-OT TURN INJ		ANGL-ST TURN PDO		S-1STOP REAR PDO		ANGL-OT ANGL INJ	
OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT CONTINUOUS SYSTEM CRASH LISTING 4th Avenue at Adair Street (Rt 8, Hwy 29) in Cornelius	L999 - 2 -REL OFFRD WTHR F- RNDBT SURF L DRVWY LIGHT	N CLR UNKNOWN N DRY N DAY		N N CLR SIGNAL N DRY N DAY		N N CLR STOP SIGN N DRY N DLIT		N CLR SIGNAL N DRY N DARK		N N RAIN ONE-WAY N WET N DLIT	
I DEPARTMENT OF TRANSPORTATION 4th Avenue	75 5	CROSS UN		CROSS . TRF		CROSS STC		CROSS TRF 0		CROSS ON	
OREGON	RD CHAR DIRECT LOCTN	INTER CN 04		INTER CN 04		INTER N 06		INTER W 06		INTER CN 01	
	CLASS COMPUT CONN # MIG TYP FIRST STREET MILEPNT SECOND STREET	14 N ADAIR ST 0 0 17.03 N 4TH AVE		14 0 N ADAIR ST 0 17.03 N 4TH AVE		14 1 BASELINE ST 0 17.03 4TH AVE		14 1 BASELINE ST 0 17.03		14 1 BASELINE ST 0 17.03 S 4TH AVE	
	COUNTY CITY URBAN AREA	01/28/2000 WASHINGTON Fri CORNELIUS 1P PORTLAND UA		2001 WASHINGTON CORNELIUS PORTLAND UA		N N N 11/17/1999 WASHINGTON Wed CORNELIUS 6P PORTLAND UA		N N N 08/03/2001 WASHINGTON Fri CORNELIUS 9P PORTLAND UA		N 11/10/2002 WASHINGTON Sun CORNELIUS SP PORTLAND UA	
CDS380 4/11/2005	S D W C O DATE E L G H R DAY D C S L K TIME	N N N N 01/28/2 Fri 1P		N N N N 10/17/2001 WASHINGTON WGG CORNELUS 2P PORTLAND U		N N N N 11/17/1 Word Wod 6P		z z		N N N N N 11/10/2 Sun 5P	
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029 TUALATIN VALLEY

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION TRANSPORTATION DATA SECTION - CRASH ANLIVSIS AND REFORTING UNIT CONTINUOUS SYSTEM CRASH LISTING 4th Avenue at Adair Street (Rt 8, Hwy 29) in Cornelius 1999 - 2003

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A S G E LICNS PED E X RES LOC	17 F OR-Y OR<25	38 M OR-Y OR<25	49 F OR-Y OR<25	60 F OR-Y OR<25	48 F OR-Y OR<25	50 F OR-Y OR>25	61 M OR-Y OR<25	39 F OR-Y OR>25	31 M OR-Y OR<25	40 M OR-X OR<25
INJ SVRTY	NONE	NONE	NONE	NONE	INJB	INJB	INJC	NONE	NONE	NONE
PRIC	DRV	DRV	DRV	DRV	DRV	DRV	DRV	DRV	DRV	DRV
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VEHICLE USE-TRLR OWNER V# TYPE	1 NONE PRVTE PSNGR	2 NONE 0 PRVTE PSNGR CA	1 NONE 0 PRVTE PSNGR CA	2 NONE PRVTE PSNGR	1 NONE 0 PRVTE PSNGR CA	2 NONE 0 PRVTE PSNGR CA	1 NONE PRVTE PSNGR	2 NONE 0 PRVTE PSNGR CA	1 NONE PRVTE PSNGR	2 NONE 0 PRVTE PSNGR CA
CRASH COLL SVRTY	ANGL-OT ANGL PDO		ANGL-OT ANGL PDO		ANGL-OT ANGL INJ		ANGL-OT ANGL INJ		ANGL-OT ANGL PDO	
OFFRD WTHR RNDBT SURF DRVWY LIGHT	CLD WET DUSK		RAIN WET DLIT		CLR DRY DAY		CLR DRY DAY		RAIN WET DAY	
OFFRD RNDBT DRVWY	N N N		z z z		N SIGNAL N		zzz		zzz	
INT-REL TRAF- CNTL	N STOP SIGN		N ONE-WAY		N TRF SIG		N UNKNOWN		CHANNEL	
INT-TYP (MEDIAN) INT-REL (LEGS TRAF- 1 (#LANES) CNTL	CROSS		CROSS 0		CROSS		CROSS		CROSS	
RD CHAR DIRECT LOCTN	INTER CN 02		INTER CN 02		INTER CN 02		INTER CN 03		INTER CN 03	
CONN # FIRST STREET SECOND STREET	BASELINE ST 4TH AVE		BASELINE ST 4TH AVE		ADAIR ST 4TH AVE		ELINE ST 4TH AVE		ELINE ST 4TH AVE	
CONN # FIRST SECOND	BASEL]		BASEL1		2 2		BAS		BAS	
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COUNTY CITY URBAN AREA	12/07/1999 WASHINGTON Tue CORNELIUS 3P PORTLAND UA		N N 12/14/2002 WASHINGTON Sat CORNELIUS 10P PORTLAND UA		08/13/2003 WASHINGTON Wed CORNELIUS		01/08/1999 WASHINGTON Fri CORNELIUS 11A PORTLAND UA		N N N 02/16/1999 WASHINGTON Tue CORNELIUS 4P PORTLAND UA	
បបភ	1999 WR		2002 WP		2003 WR		W 6661		M 6661	
DATE DAY TIME	12/01/1 Tue 3P		12/14/2 Sat 10P		08/13/2 Wod 11A		01/08/1 Fri 11A		02/16/1 Tue 4P	
S C C C C C C C C C C C C C C C C C C C	z z		z z z		z z z		z z z		z z	
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SER#. INVEST	10856 CITY		10641 NONE		06604 CITY		00167 NO RPT		01419 CITY	

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OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT CONTINUOUS SYSTEM CRASH LISTING 4th Avenue at Adaix Street (Rt 8, Hwy 29) in Cornelius 1999 - 2003
INT-TYP (MEDIAN) INT-REL OFFRD LEGS TRAF- RNDBT (#LANES) CNTL DRVWY
CROSS N STOP SIGN
CROSS N STOP SIGN
CROSS N ONE-WAY 0
CROSS N TRF SIGNAL 0
CROSS N UNKNOWN 0

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1 DRV INJC 18 M OR-Y OR<25

2 NONE 0 STRGHT PRVTE S N PSNGR CA

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029 TUALATIN VALLEY			•		4th Avenu	4th Avenue at Adair Street (Rt 8, Hwy 29) in Cornelius 1999 - 2003	(Rt 8, Hwy 2003	29) in Corne	lius					
S D W R S W R S W C O DATE SER#. E L G H R DAY INVEST D C S L K TIME	COUNTY CITY URBAN AREA	CLASS COMPNT MLG TYP MILEPNT	CONN # FIRST STREET SECOND STREET	RD CHAR DIRECT LOCIN	INT-TYP (MEDIAN) INT-REL LEGS TRAF- (#LANES) CNTL	INT-REL OFFRD WTHR TRAF- RNDBT SURF CNTL DRVWY LIGHT	CRASH COLL T SVRTY	VEHICLE USE-TRLR OWNER V# TYPE	MOVE FROM TO	PRTC P# TYPE	INJ	A S G E LICNS PED E X RES LOC	ERROR	ACT EVENT
06133 N N N N 07/26/1999 CITY Mon 12P	N 07/26/1999 WASHINGTON Mon CORNELIUS 12P PORTLAND UA	14 1 0 17.03	BASELINE ST 4TH AVE	INTER CN 04	CROSS 8	N N CLR STOP SIGN N DRY N DAY	O-1TURN TURN PDO	1 NONE 0 PRVTE PSNGR CA	TURN-L N E	1 DRV	NONE	36 M N-VAL OR<25	004	. 000
								2 NONE 0 PRVTE PSNGR CA	STRGHT S N J	1 DRV	NONE	37 F OR-Y OR<25	000	000
09537 N N N N 11/06/1999 CITY 5at 11A	N 11/06/1999 WASHINGTON Sat CORNELIUS 11A PORTLAND UA	14 1 0 17.03	BASELINE ST 4TH AVE	INTER CN 04	CROSS 8	N N CLD STOP SIGN N DRY N DAY	ANGL-OT ANGL INJ	1 NONE 0 PRVTE PSNGR CA	STRGHT S N	1 DRV	INJC	38 M OR-Y OR<25	028	015
								2 NONE 0 PRVTE PSNGR CA	STRGHT W E	1 DRV	NONE	55 M OR-Y OR<25	000	000
00310 N N N N 01/12/2000 WASHINGTON CITY Wed CORNELIUS 6P PORTIAND U	O WASHINGTON CORNELIUS FORTLAND UA	14 1 0 17.03	BASELINE ST 4TH AVE	INTER CN 04	CROSS 6	STOP SIGN N SNOW N SUO N N DLIT	ANGL-OT ANGL INJ	1 NONE 0 PRVTE PSNGR CA	STRGHT S N	1 DRV	NONE	26 F OR-Y OR<25	021	015
								2 NONE 0 PRVTE PSNGR CA	STRGHT W E	1 DRV	INJC	43 M OR-Y OR<25	000	000
UU553 N N N N N 01/22/2000 WASHINGTON NO RPT SAt CORNELIUS 7P PORTLAND U	MASHINGTON CORNELIUS PORTLAND UA	14 1 0 17.03	BASELINE ST 4TH AVE	INTER CN 04	CROSS 0	N N CLR STOP SIGN N DRY N DLIT	ANGL-OT ANGL INJ	1 NONE 0 PRUTE PSNGR CA	STRGHT S N	1 DRV	NONE	OO U UNK UNK	021	053,079 000
								2 NONE 0 PRVTE PSNGR CA	STRGHT W E 1	DRV	INJC	43 F OR-Y OR<25	000	000
02665 N N N N N 03/28/2000 WASHINGTON CITY 3P PORTLAND UJ) WASHINGTON CORNELIUS PORTLAND UA	14 1 0 17.03	BASELINE ST 4TH AVE	INTER CN 04	CROSS s	N N CLD STOP SIGN N DRY N DAY	ANGL-OT ANGL INJ	1 NONE 0 PRVTE PSNGR CA	STRGHT W E			34 M OR-Y OR<25	000	000

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	ERROR	000	028	000	028	020	000	000	720	000
	A S G E LICNS PED E X RES LOC	47 M OR-Y OR<25	50 M OR-Y OR<25	47 M OR-Y OR<25	36 F OR-Y OR<25	66 F OR-Y OR<25	37 M OR-Y OR<25	74 M OR-Y OR<25	84 M OR-Y OR<25	56 M
NO.	PRTC INJ TYPE SVRTY	DRV NONE	DRV INJC	DRV INJC	DRV NONE	DRV INJC	DRV INJC	DRV NONE	NONE	BIK INJC
PMENT DIVISI ORTING UNIT	MOVE FROM TO P#	STRGHT W E	STRGHT S N	STRGHT WE E 1 1	STRGHT S N 1	STRGHT W E 1 I	STRGHT N S 1 I	STRGHT S N 1 L	-	STRGHT 1 E S N
OREGON DEFARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT CONTINUOUS SYSTEM CRASH LISTING CONTINUOUS SYSTEM (RR. B, HMY 29) In Cornelius	VEHICLE USE-TRLR OWNER V# TYPE	1 NONE 0 PRVTE PSNGR CA	2 NONE 0 PRVTE PSNGR CA	1 NONE 0 PRVTE PSNGR CA	2 NONE 0 PRVTE PSNGR CA	1 NONE PRVTE PSNGR CA	2 NONE PRVTE PSNGR CA	3 NONE PRVTE PSNGR CA	1 NONE PRVTE PSNGR CA	
- TRANSPORT CRASH ANAL: M CRASH LIS (Rt 8, Hwy	2003 CRASH COLL F SVRTY	ANGL-OT ANGL INJ		ANGL-OT ANGL INJ		ANGL-OT ANGL INJ			BIKE TURN INJ	
ANSPORTATION TA SECTION - INUOUS SYSTE Adair Street	1999 - 2003 OFFRD WTHR CRARNDBT SURF COI	N RAIN GN N WET N DAY		N CLR GN N DRY N DAY		N CLD WAL N DRY N DAY			N CLR N DRY N DAY	
TMENT OF TRA ORTATION DAY CONT	INT-TYP (MEDIAN) INT-REL LEGS TRAF- (#LANES) CNTL	SSS N STOP SIGN		SS N STOP SIGN		SS N TRF SIGNAL			SS N UNKNOWN	
REGON DEPAR TRANSP 4th	INT-TYP RD CHAR (MEDIAN) DIRECT LEGS LOCTN (#LANES)	ER CR		ER CROSS		ER CROSS			ER CROSS	
0		INT T CN 04		INT T CN AVE 04		INTER T CN			INTER T CN AVE 04	
	CLASS COMPNT CONN # MLG TYP FIRST STREET MILEPNT SECOND STREET	14 1 BASELINE ST 0 17.03 4TH AVE		14 1 BASELINE ST 0 17.03 S 4TH AVE		14 1 BASELINE ST 0 17.03			14 1 BASELINE ST 0 17.03 S 4TH AVE	
	COUNTY CITY URBAN AREA	09/03/2000 WASHINGTON Sun CORNELIUS 10A PORTLAND UA		đ		02/14/2003 WASHINGTON 1 Fri CORNELIUS 1 9A PORTLAND UA			05/18/2003 WASHINGTON 1 Sun CORNELIUS 1 12P PORTLAND UA 0	
4/11/2005 IN VALLEY	D A C C DATE L G H R DAY C S L K TIME	z z z		N N N 02/08/2002 WASHINGTON Fri CORNELIUS 7A PORTLAND UI		z			z	
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OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT CRASH SUMMARIES BY YEAR BY COLLISION TYPE 4th Avenue at Baseline Street (Rt 8, Hwy 29) in Comelius 1999 - 2003

PAGE: 1

	- NON	PROPERTY										INTER-	
FATAL	FATAL	DAMAGE	TOTAL	PEOPLE	PEOPLE		DRY	WET			INTER-	SECTION	OFF.
CRASHES	CRASHES	ONLY	CRASHES	KILLED	INJURED 1	RUCKS	SURF	SURF	DAY	DARK	SECTION	RELATED	ROAD
0	4	8	9	0	7	0	က	က	ເດ	-	9	0	0
0	0	2	2	0	0	0	7	0	-	_	2	0	0
0	4	4	80	0	7	0	2	ယ်	9	2	80	0	0
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0	_	-	2	0	_	0	5	0	7	0	2	0	0
0	12	თ	21	0	19	0	4	7	15	9	27	0	0
	FATAL CRASHES 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	S. C. C. C. C. C. C. C. C. C. C. C. C. C.	NON- PROF FATAL DA CRASHES 0 0 0 0 0 0 1 1 1	NON- PROPERTY FATAL DAMAGE CRASHES ONLY CR 4 2 2 4 4 4 5 0 1 0 1 1 2 1 1 1 1 1 1 1 1	NON- PROPERTY FATAL DAMAGE TOTAL F CRASHES ONLY CRASHES 0 2 2 4 4 4 4 8 8 5 0 0 5 5 0 0 1 1 1 1 0 0 1 1 1 1 1 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1	NON- PROPERTY FATAL DAMAGE TOTAL PEOPLE PEOPLE ORASHES ONLY CRASHES KILLED INJURED ORASHES ONLY CRASHES KILLED ORASHES ONLY CRASHES KILLED ORASHES ONLY CRASHES KILLED ORASHES ONLY CRASHES KILLED ORASHES ONLY CRASHES KILLED ORASHES ONLY CRASHES CONTROLLED ORASHES ONLY CRASHES CONTROLLED ORASHES ONLY CRASHES ORASHES ONLY CRASHES CONTROLLED ORASHES ONLY CRASHES ONLY CRASHES ORASHES ONLY CRASHES ONLY CRASHES ORASHES ONLY CRASHES ONLY CRASHES ORASHES ONLY CRASHES ONLY CRASHES ORASHES ONLY CRASHES ONLY CRASHES ORASHES ONLY CRASHES ONLY CRASHES ORASHES ONLY CRASHES ONLY CRASHES ORASHES ONLY CRASHES ONLY CRASHES ORASHES ONLY	NON- PROPERTY FATAL DAMAGE TOTAL PEOPLE PEOPLE CRASHES ONLY CRASHES KILLED INJURED TRUCK 4 2 6 0 7 4 4 4 8 0 7 5 0 5 0 7 7 6 1 1 1 0 0 0 1 1 1 0 0 0 1 1 1 0 0 0 1 1 1 0 0 0 1 1 1 0 0 0 1 1 1 0 0 0 1 1 1 0 0 0 1 1 1 0 0 0 1 1 1 0 0 0 1 1 1 0 0 0 1 1 1 0 0 0 1 0 0 0 1 0 0 0 0	NON- PROPERTY FATAL DAMAGE TOTAL PEOPLE INJURED TRUCKS CRASHES ONLY CRASHES KILLED INJURED TRUCKS 4	NON- PROPERTY FATAL DAMAGE TOTAL PEOPLE INJURED TRUCKS SURF 4	NON- PROPERTY FATAL DAMAGE TOTAL PEOPLE PEOPLE SURF SURF SURF ONLY CRASHES KILLED INJURED TRUCKS SURF ONLY CRASHES KILLED INJURED TRUCKS SURF ONLY CRASHES KILLED INJURED TRUCKS SURF ONLY CRASHES KILLED INJURED TRUCKS SURF ONLY CRASHES KILLED INJURED TRUCKS SURF ONLY CRASHES ONLY	NON- PROPERTY CRASHES KILLED INJURED TRUCKS SURF SURF DARK CRASHES CONLY CRASHES KILLED INJURED TRUCKS SURF SURF DARK The street of the stree	NON- PROPERTY FATAL DAMAGE TOTAL PEOPLE PEOPLE PEOPLE SURF SURF SURF DAY DARK A	NON- PROPERTY

PAGE	CAUSE	22, 12 22 12	000	08		0 4	0.4	03		03	
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	ERROR	026	000	002	000	000	020	021	. 000	021	000
	A S G E LICNS PED E X RES LOC	61 M OR-Y OR<25	48 F OR-Y OR<25	33 F UNK UNK	24 M OR-Y OR<25	47 F OR-Y OR<25	44 M OR-Y OR<25		38 M OR-Y OR<25	49 F OR-Y OR<25	60 F OR-Y OR<25
	INJ SVRTY	NONE	NONE	NONE	NONE	INJA	INJC	NONE OF	NONE	NONE	NONE
ISION	PRTC P# TYPE	1 DRV	1 DRV	1 DRV	1 DRV	1 DRV	1 DRV	1 DRV	L DRV	1 DRV	DRV
MENT DIV. TING UNI	MOVE FROM TO	STRGHT W E	STOP W E	TURN-L W N	STOP N S	STRGHT W E	STRGHT N S	STRGHT S N	STRGHT E W	STRGHT S N	STRGHT W E
OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT CONTINGUOUS SYSTEM CRASH LISTING 4th Avenue at Baselline Street (Rt 8, Hwy 29) in Cornellus 1999 - 2003	VEHICLE USE-TRLR OWNER V# TYPE	1 NONE 0 PRVTE PSNGR CA	2 NONE 0 PRVTE PSNGR CA	1 NONE 0 PRVTE PSNGR CA	2 NONE 0 PRVTE PSNGR CA	1 NONE 0 PRVTE PSNGR CA	2 NONE 0 PRVTE PSNGR CA	1 NONE 0 PRVTE PSNGR CA	2 NONE 0 PRVTE PSNGR CA	1 NONE 0 PRVTE PSNGR CA	2 NONE 0 PRVTE PSNGR CA
TRANSPORT RASH ANAL CRASH LIS (Rt 8, Hw	CRASH COLL SVRTY	S-ISTOP REAR PDO		ANGL-ST TURN PDO		ANGL-OT ANGL INJ		ANGL-OT ANGL PDO		ANGL-OT ANGL PDO	
ration - Ci System Street 1999 - 20	WTHR SURF LIGHT	CLR DRY DAY		CLR DRY DLIT		RAIN WET DLIT		CLD WET DUSK		RAIN WET DLIT	
TRANSPOR DATA SEC ONTINUOUS Baseline	REL OFFRD - RNDBT DRVWY	N N N SIGNAL N		N N STOP SIGN N		N N ONE-WAY N		N N N P SIGN N		N N ONE-WAY N	
TMENT OF PORTATION C Avenue at	INT-TYP (MEDIAN) INT-REL LEGS TRAF- (#LANES) CNTL	CROSS TRF		CROSS STO		CROSS ON!		CROSS N STOP 0		CROSS ON	
SON DEPARTRANSI		CRC									
OREC	RD CHAR DIRECT LOCTN	INTER W 06		INTER N 06		INTER CN 01		INTER CN 02		INTER CN 02	
	CONN # FIRST STREET SECOND STREET	BASELINE ST S 4TH AVE		BASELINE ST 4TH AVE		BASELINE ST S 4TH AVE		BASELINE ST 4TH AVE		BASELINE ST 4TH AVE	
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	CLASS COMPNT MLG TYP MILEPNT	14 0 16		14 1 0 17		14 1 0 17		14 1 0 17		14 1 0 17	
	COUNTY CITY URBAN AREA	06/05/2003 WASHINGTON Thu CORNELIUS 12P PORTLAND UA		11/17/1999 WASHINGTON Wed CORNELIUS 6P PORTLAND UA		N N N 11/10/2002 WASHINGTON Sun Sun PORTLIUS 5P PORTLAND UA		N N 12/07/1999 WASHINGTON Tuc CORNELIUS 3P PORTLAND UA		N N N N 12/14/2002 WASHINGTON Sat LUP PORTLAND UA	
2	DATE DAY TIME	06/05/2003 Thu 12P		11/17/1999 Wed 6P		11/10/2003 Sun 5P		12/07/1999 Tuc 3P		12/14/200; Sat 10P	
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TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPOR		
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OPMENT DIVISION ORTING UNIT CONTINUOUS SYSTEM CRASH LISTING 4th Avenue at Baseline Street (Rt 8, Hwy 29) in Cornelius 1999 - 2003

	CAUSE	02	02	0.5	02	0.2	. 02		03		02	02
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	ERROR	000	028	000	028	000	028		021	000	000	001
	A S G E LICNS PED E X RES LOC	61 M OR-Y OR<25	39 F OR-Y OR>25	31 M OR-Y OR<25	40 M OR-Y OR<25	51 M OR-Y OR<25	25 M OR-Y OR<25	25 M 01 M	24 M OR-Y OR<25	26 M OR-Y OR<25	OO U UNK UNK	29 M OR-Y OR<25
	INJ SVRTY	INJC	NONE	NONE	NONE	INJB	INJB	INJB NO<5	INJC	INJC	NONE	NONE
	PRIC P# IYPE	1 DRV	1 DRV	1 DRV	1 DRV	1 DRV	1 DRV	2 PSN 3 PSN	1 DRV	1 DRV	1 DRV	1 DRV
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4th Avenue at Baseline Street (Rt 8, Hwy 29) in Cornelius $1999-2003$	VEHICLE USE-TRLR OWNER V# TYPE	1 NONE 0 PRUTE PSNGR CA	2 NONE 0 PRVTE PSNGR CA	1 NONE 0 PRUTE PSNGR CA	2 NONE 0 PRUTE PSNGR CA	1 NONE 0 PRVTE PSNGR CA	2 NONE 0 PRVTE PSNGR CA		1 NONE 0 PRVTE PSNGR CA	2 NONE 0 PRVTE PSNGR CA	1 NONE 0 PRVTE PSNGR CA	2 NONE 0 PRVTE PSNGR CA
(Rt 8, Hw 003	CRASH COLL SVRTY	ANGL-OT ANGL INJ		ANGL-OT ANGL PDO		ANGL-OT ANGL INJ			ANGL-OT ANGL INJ		O-1TURN TURN PDO	
eline Street 1999 - 2	OFFRD WTHR RNDBT SURF DRVWY LIGHT	N CLR N DRY N DAY		N RAIN N WET N DAY		N CLD N DRY N DAY			N CLR N DRY N DAY		N CLR N DRY N DAY	
e at Base	INT-REL TRAF- CNTL	N UNKNOWN		N CHANNEL		N STOP SIGN			STOP SIGN		N ONE-WAY	
4th Avenue	INT-TYP (MEDIAN) INT-REL C LEGS TRAF- F (#LANES) CNTL E	CROSS 0		CROSS		CROSS 0			CROSS		CROSS	
	RD CHAR DIRECT LOCTN	INTER CN 03		INTER CN 03		INTER CN 03			INTER CN 03		INTER CN 03	
	CONN # FIRST STREET SECOND STREET	BASELINE ST 4TH AVE		BASELINE ST 4TH AVE		BASELINE ST 4TH AVE			BASELINE ST 4TH AVE		BASELINE ST S 4TH AVE	
	CLASS COMPNT MLG TYP MILEPNT	14 1 0 17.03		14 1 0 17.03		14 1 0 17.03			14 1 0 17.03		14 1 0 17.03	
	COUNTY CITY URBAN AREA	01/08/1999 WASHINGTON Fri CORNELIUS 11A PORTLAND UA		999 WASHINGTON CORNELIUS PORTLAND UA		999 WASHINGTON CORNELIUS PORTLAND UA			08/06/2000 WASHINGTON Sun CORNELIUS SP PORTLAND UA		N N 06/23/2001 WASHINGTON Sat CORNELIUS UNK PORTLAND UA	
029 TUALATIN VALLEY	S D P R S W E B U C O DATE E L G H R DAY D C S L K TIME	2 2 2 2 2		N N N N 02/16/1999 WASHINGTON TUC CORNELIUS 4P PORTLAND U,		N N N N N 04/09/1999 WASHINGTON Fri CORNELIUS IP PORTLAND U			N N N N N 08/06/20 Sun 5P		N N N N N 06/23/20 Sat UNK	
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CDS380 4/11/2005		OREGON	DEPARTMENT	OREGON DEFARITMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT CONTINUOUS SYSTEM CRASH LISTING	- TRANSPORT CRASH ANAL) M CRASH LIS	TATION DEVELC YSIS AND REPO TING	PMENT DIV	ISION				PAGE: 3
029 TUALATIN VALLEY			4th Avenu	4th Avenue at Baseline Street (Rt 8, Hwy 29) in Cornelius 1999 – 2003	2003	y 29) in Cor	nelius					
S D P R S W E A U C O DATE COUNTY SER#. E L G H R DAY CITY INVEST D C S L K TIME URBAN AREA	CLASS COMPNT CONN # MLG TYP FIRST STREET MILEPNT SECOND STREET	RD CHAR DIRECT LOCTN	INT-TYP (MEDIAN) INT-REL LEGS TRAF- (#LANES) CNTL	INT-REL OFFRD WTHR TRAF- RNDBT SURF CNTL DRVWY LIGHT	CRASH COLL I SVRTY	VEHICLE USE-TRLR OWNER V# TYPE	MOVE FROM TO	PRTC INJ P# TYPE SVRTY	A S G E LICNS PED E X RES LOC	ERROR	ACT EVENT	CAUSE
06847 N N N N 08/10/2001 WASHINGTON CITY FIL CORNELIUS 7A PORTLAND UA	14 1 BASELINE ST 0 17.03 4TH AVE	INTER CN 03	CROSS 0	N CLR TRF SIGNAL N DRY N DAY	ANGL-OT ANGL PDO	1 NONE 0 PRVTE PSNGR CA	STRGHT W E	1 DRV NONE	23 M OR-Y OR<25	. 000	000	04
						2 NONE 0 PRVTE PSNGR CA	STRGHT N S	1 DRV NONE	44 M OR-Y OR<25	020	000	04
03840 N N N N 05/08/1999 WASHINGTON CITY SAL CORNELIUS 2P PORTLAND UA	14 1 BASELINE ST 0 17.03 4TH AVE	INTER CN 04	CROSS	N N CLD UNKNOWN N WET N DAY	ANGL-OT ANGL INJ	1 NONE 0 PRVTE PSNGR CA	STRGHT S N	1 DRV NONE	26 M OR-Y OR<25	028	015	02
						2 NONE 0 PRVTE PSNGR CA	STRGHT W E	1 DRV INJB	32 M OR-Y OR<25 32 F	000	000	
06133 N N N N 07/26/1999 WASHINGTON CITY MON CORNELIUS 12P PORTLAND UA	14 1 BASELINE ST 0 17.03 4TH AVE	INTER CN 04	CROSS	N N CLR STOP SIGN N DRY N DAY	O-1TURN TURN PDO	1 NONE 0 PRVTE PSNGR CA	TURN-L	DRV		004	000	02 02
						2 NONE 0 PRVTE PSNGR CA	STRGHT S N	DRV NONE	37 F OR-Y OR<25	000	000	
U9537 N N N N 11/06/1999 WASHINGTON CITY Sat CORNELIUS 11A PORTLAND UA	14 1 BASELINE ST 0 17.03 4TH AVE	INTER CN 04	CROSS 0	N N CLD STOP SIGN N DRY N DAY	ANGL-OT ANGL INJ	1 NONE 0 PRVTE PSNGR CA	STRGHT S N	DRV INJC	38 M OR-Y OR<25	028	015	02
			·			2 NONE 0 PRVTE PSNGR CA	STRGHT W E.	DRV NONE	55 M OR-Y OR<25	000	000	
00310 N N N N 01/12/2000 WASHINGTON CITY Med CORNELIUS 6P PORTLAND UA	14 1 BASELINE ST 0 17.03 4TH AVE	INTER CN 04	CROSS	STOP SIGN N SNOW N SNO N N DLIT	ANGL-OT ANGL INJ	1 NONE 0 PRVTE PSNGR CA	STRGHT S N	DRV NONE	26 F OR-Y OR<25	021	015	03
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OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION TRANSPORTATION DATA SECTION - CRASH ARALYSIS AND REPORTING UNIT CONTINUOUS SYSTEM CRASH LISTING	4th Avenue at Baseline Street (Rt 8, Hwy 29) in Cornelius 1999 - 2003
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029 TUALATIN VALLEY				* *	AANSFORIAII 4th Avenue	TRANSFORTATION DATA SECTION - CASASA AMALYSIS AND REPORTING UNIT 4th Avenue at Baseline Street (Rt 8, Hwy 29) in Cornelius 1999 - 2003	CKASH ANAL SM CRASH LIS et (Rt 8, Hw 2003	rsis Anu Ker Ting y 29) in Cor	ORTING UNI	÷		,			
S D P R S W E A U C O DATE E L G H R DAY O C S L K TINE	COUNTY CITY URBAN AREA	CLASS COMPNT MLG TYP MILEPNT	CONN # FIRST STREET SECOND STREET	RD CHAR DIRECT LOCTN	INT-TYP (MEDIAN) INT-REL LEGS TRAF- (#LANES) CNTL	NT-REL OFFRD WTHR RAF- RNDBT SORF NTL DRVWY LIGHT	CRASH COLL T SVRTY	VEHICLE USE-TRLR OWNER V# TYPE	MOVE FROM TO	PRTC INJ P# TYPE SVRTY	A S I G E LICNS XTY E X RES	PED	ERROR	ACT EVENT	CAUSE
N N N N 01/22/2000 WASHINGTON Sat CORNELIUS 7P PORTLAND U.	WASHINGTON CORNELIUS PORTLAND UA	14 1 0 17.03	BASELINE ST 4TH AVE	INTER CN 04	CROSS 0	N N CLR STOP SIGN N DRY N DLIT	ANGL-OT ANGL INJ	1 NONE 0 PRVTE PSNGR CA	STRGHT S N	1 DRV NONE	IE 00 U UNK		021	053,079	03
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N N N N 03/28/2000 WASHINGTON Tuc CORNELIUS 3P PORTLAND U	WASHINGTON CORNELIUS PORTLAND UA	14 1 0 17.03	BASELINE ST 4TH AVE	INTER CN 04	CROSS	N CLD STOP SIGN N DRY N DAY	ANGL-OT ANGL INJ	1 NONE 0 PRVTE PSNGR CA	STRGHT W E	DRV	34 × 34	.0	000	000	0.5
								2 NONE 0 PRVTE PSNGR CA	STRGHT S N	DRV INJC	18 M	v	028	015	02
N N N N 09/03/2000 WASHINGTON Sun CORNELIUS 10A PORTLAND U	WASHINGTON CORNELIUS PORTLAND UA	14 1 0 17.03	BASELINE ST 4TH AVE	INTER CN 04	CROSS 0	N N N RAIN STOP SIGN N WET N DAY	ANGL-OT ANGL INJ	1 NONE 0 PRVTE PSNGR CA	STRGHT W E	DRV NONE	M 74		000	000	02
								2 NONE 0 PRVTE PSNGR CA	STRGHT S N	DRV INJC	E 05	ıΩ	028	015	02
N N N N 02/08/2002 WASHINGTON Fri CORNELIUS 7A PORTLAND U	WASHINGTON CORNELIUS PORTLAND UA	14 1 0 17.03	BASELINE ST S 4TH AVE	INTER CN 04	CROSS 0	N N CLR STOP SIGN N DRY N DAY	ANGL-OT ANGL INJ	1 NONE 0 PRVTE PSNGR CA	STRGHT W E	DRV INJC	47 M	νO:	. 000	000	02
								2 NONE 0 PRVTE PSNGR CA	STRGHT S N 1	DRV NONE	E 36 F OR-Y OR<25	ហ	028	015	02
N N N 05/18/2003 WASHINGTON Sun CORNELIUS 12P PORTLAND UI	WASHINGTON CORNELIUS PORTLAND UA	14 1 0 17.03	BASELINE ST S 4TH AVE	INTER CN 04	CROSS	N N CLR UNKNOWN N DRY N DAY	BIKE TURN INJ	1 NONE PRVTE PSNGR CA	TURN-L N E 1 STRGHT 1	DRV NONE BIK INJC	8 6 5 8 8 8	10		000 000 041	08,02 00 08,02 00
N N N N 02/28/2002 WASHINGTON Thu BA PORTLAND U	WASHINGTON CORNELIUS PORTLAND UA	14 1 0 17.06	14 BASELINE ST 0 17.06 S 4TH AVE	INTER W 06	CROSS T	N N CLR TRF SIGNAL N DRY N DAY	S-1STOP REAR PDO	1 NONE 0 PRVTE PSNGR CA	STRG	DRV NONE	49 F	ιο.	026	000	10

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OREGON DEFARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT CONTINUOUS SYSTEM CRASH LISTING 4th Avenue at Baseline Street (Rt 8, Hwy 29) in Cornelius 1999 - 2003	VEHICLE USE-TRLR MOVE OWNER FROM V# TYPE TO	2 NONE 0 STOP PRVTE W 1 PSNGR CA
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TATION - TRA CTION - CRASH S SYSTEM CRA E Street (Rt 1999 - 2003		
F TRANSPORTATION - TRANSPORTATION NO DATA SECTION - CRASH ANALYSIS; CONTINUOUS SYSTEM CRASH LISTING t Baseline Street (Rt 8, Hwy 29) 1999 - 2003	OFFRD WTHR RNDBT SURF DRVWY LIGHT	
r OF TRA TION DAT CONT e at Bas	INT-REL TRAF- CNTL	
DEPARTMENT RANSPORTA1 4th Avenu	INT-TYP (MEDIAN) INT-REL OFFRD WTHR LEGS TRAF- RNDBT SURF (#LANES) CWTL DRVWY ILGHT	
OREGON	RD CHAR DIRECT LOCTN	
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OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT CRASH SUMMARIES BY YEAR BY COLLISION TYPE 10th Avenue at Adair Street (Rt 8, Hwy 29) in Cornelius 1999 - 2003

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	INJ SVRTY	NONE	NONE	NONE	INJC	NONE	NONE	NONE	INJC	NONE	INJC
	PRTC P# TYPE	1 DRV	1 DRV	1 DRV	1 DRV	DRV	1 DRV	1 DRV	DRV	1 DRV	DRV
ius	MOVE FROM TO	STRGHT N S	TURN-L S W 1	STRGHT E W	STRGHT N S	TURN-L S W	STRGHT N S	STRGHT E W	STRGHT N S 1	STRGHT E W	STRGHT S N
ING 29) in Cornel	VEHICLE USE-TRLR OWNER V# TYPE	1 NONE 0 PRVTE PSNGR CA	2 NONE 0 PRVTE PSNGR CA	1 NONE 1 PRVTE SEMI TOW	2 NONE 0 PRVTE PSNGR CA	1 NONE 0 PRVTE PSNGR CA	2 NONE 0 PRVTE PSNGR CA	1 NONE 0 PUBLC SCHL BUS	2 NONE 0 PRVTE PSNGR CA	1 NONE 0 PRVTE PSNGR CA	2 NONE 0 PRVTE PSNGR CA
CRASH LIST Rt 8, Hwy 3	CRASH COLL SVRTY	O-1TURN TURN PDO		ANGL-OT ANGL INJ		O-1TURN TURN PDO		ANGL-OT ANGL INJ		ANGL-OT ANGL INJ	
CONTINUOUS SYSTEM CRASH LISTING CONTINUOUS SYSTEM (RR 9, Hwy 29) in Cornelius 1999 - 2003	INT-TYP (MEDIAN) INT-REL OFFRD WTHR LEGS TRAF- RNDBT SURF (#LANES) CNTL DRUWY LIGHT	N CLR TRE SIGNAL N DRY N DAY		N N CLR TRF SIGNAL N DRY N DAY		N CLR TRF SIGNAL N DRY N DAY		N N CLR TRF SIGNAL N DRY N DAY		N N CLR ONE-WAY N DRY N DAY	
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	RD CHAR DIRECT LOCTN	INTER CN 01		INTER CN 01		INTER CN 01		INTER CN 01		INTER CN 02	
	CLASS COMPN: CONN # MLG TYP FIRST STREET MILEFUT SECOND STREET	14 0 N ADAIR ST 0 16.67 N 10TH AVE		14 0 N ADAIR ST 0 16.67 N LOTH AVE		14 0 N ADAIR ST 0 16.67 N 10TH AVE		14 0 N ADAIR ST 0 16.67 N 10TH AVE		14 N ADAIR ST 0 0 16.67 N 10TH AVE	
	COUNTY CITY URBAN AREA	01/29/2001 WASHINGTON Mon CORNELIUS 3P PORTLAND UA		09/16/2001 WASHINGTON Sun CORNELIUS 9A PORTLAND UA		07/04/2002 WASHINGTON Thu CORNELLUS 11A PORTLAND UA		N 09/04/2002 WASHINGTON WCd CORNELIUS 7A PORTLAND UA		N 06/07/2001 WASHINGTON Thu CORNELIUS 2P PORTLAND UA	
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S D WATE S W SER*. E L G H R DAYE INVEST D C S L K TINE	COUNTY CITY URBAN AREA	CLASS COMPNT CONN # MLG TYP FIRST MILEPNT SECOND	STREET	RD CHAR DIRECT LOCTN	INT-TYP (MEDIAN) LEGS (#LANES)	INT-REL OFFRD WTHR TRAF- RNDBT SURF CUTL DRYWY LIGHT	CRASH COLL SVRTY	VEHICLE USE-TRLR OWNER	MOVE FROM TO P#	PRTC INJ	A S G E LICNS PED C E X RES LOC	ERROR	ACT EVENT
								3 NONE 0 PRVTE PSNGR CA	STRGHT N S 1	DRV NONE	50 F OR-Y OR<25	000	000
07117 N N N N 08/17/2001 WASHINGTON CITY Fri CORNELIUS 6P PORTIAND U	WASHINGTON CORNELIUS PORTLAND UA	14 0 BASEI 0 16.67 N	BASELINE ST N 10TH AVE	INTER CN 02	CROSS	N N CLR ONE-WAY N DRY N DAY	S-1TURN TURN PDO	1 NONE 0 PRVTE PSNGR CA	TURN-L W N	DRV NONE	30 M OR-Y OR<25	000	000
								2 NONE 0 PRVTE PSNGR CA	STRGHT W E	DRV NONE	54 F OR-Y OR>25	003	000
03416 N N N N 05/03/2002 WASHINGTON CITY Fx1 CORNELIUS 10A PORTLAND U	WASHINGTON CORNELIUS PORTLAND UA	14 0 N AE 0 16.67 N	ADAIR ST 10TH AVE	INTER CN 02	CROSS	N N CLR TRF SIGNAL N DRY N DAY	ANGL-OT ANGL INJ	1 NONE 0 PRVTE PSNGR CA	STRGHT E W	DRV INJC	77 F OR-Y OR<25	047	000
								2 NONE 0 PRVTE PSNGR CA	STRGHT S N	DRV NONE	30 M OR-Y OR<25	047	000
06576 N N N N 08/13/2002 WASHINGTON NO RPT TUC CORNELIUS 7A PORTLAND U	WASHINGTON CORNELIUS PORTLAND UA	14 0 0 16,67 N	N ADAIR ST N 10TH AVE	INTER CN 02	CROSS	N N CLR TRF SIGNAL N DRY N DAY	ANGL-OT ANGL INJ	1 NONE 0 PRVTE PSNGR CA	STRGHT S N	DRV INJC	23 F OR-Y OR<25	000	000
								2 NONE 0 PRVTE PSNGR CA	STRGHT E W 1		33 M OR-Y OR<25	020	000
10072 NNNN 11/03/2000 WASHINGTON CITY Fri 1P	Washington	02 0 0 16.67		INTER CN 04	CROSS	N N CLR TRF SIGNAL N DRY N DAY	O-1TURN TURN INJ	1 NONE 0 PRVTE PSNGR CA	2 TURN-L N E	PSN INJC	46 M 16 F OR-X OR<25	000	000
								2 NONE 0 PRVTE PSNGR CA	STRGHT S N	DRV INJB	19 M OR-Y OR<25	020	000
07904 N N N N 09/18/2002 WASHINGTON NONE Wed CORNELIUS 2P PORTLAND U	WASHINGTON CORNELIUS PORTLAND UA	14 0 N AD 0 16.67 N	N ADAIR ST N 10TH AVE	INTER CN 04	CROSS	N CLR TRF SIGNAL N DRY N DAY	ANGL-OT ANGL PDO	1 NONE 0 PRVTE PSNGR CA	STRGHT S N	DRV NONE	64 M OR-Y OR<25	000	000

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PAGE: 3	CAUSE	04	02		90		04		04		70
	ACT EVENT	000	000	000	000	000	000	. 000	000	000	. 000
	ERROR	020	004	000	031	000	020	000	020	000	026
	A S G E LICNS PED E X RES LOC	30 F OR-Y OR<25	16 M OR-Y OR<25	79 M OR-Y OR<25	75 M OR-Y OR<25	47 M OR-Y OR<25	44 M OR-Y OR<25	44 M OR-Y OR<25	21 F OR-Y OR<25	02 F 21 M OR-Y OR<25	21 F N-VAL OR<25
	C INJ E SVRTY	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NO<5 NONE	NONE
VISION IIT	PRTC P# TYPE	1 DRV	1 DRV	1 DRV	1 DRV	1 DRV	1 DRV	1 DRV	1 DRV	2 PSN 1 DRV	1 DRV
PMENT DI RTING UN lius	MOVE FROM TO	STRGHT W E	TURN-L S W	STRGHT N S	TURN-R R N	TURN-R	STRGHT E W	STRGHT S N	STRGHT E W	STRGHT S N	STRGHT E W
TATION DEVELON YSIS AND REPO STING 7 29) in Corne	VEHICLE USE-TRLR OWNER V# TYPE	2 NONE 0 PRVTE PSNGR CA	1 NONE 0 PRVTE PSNGR CA	2 NONE 0 PRVTE PSNGR CA	I NONE 0 PRVTE PSNGR CA	2 NONE 1 PRVTE SEMI TOW	1 NONE 0 PRVTE PSNGR CA	2 NONE 0 PRVTE PSNGR CA	1 NONE 0 PRVTE PSNGR CA	2 NONE 0 PRVTE PSNGR CA	1 NONE 0 PRVTE PSNGR CA
TRANSPOR CRASH ANAL CRASH LIS (Rt 8, Hwy	CRASH COLL SVRTY		O-1TURN TURN PDO		S-OTHER TURN PDO		ANGL-OT ANGL PDO		ANGL-OT ANGL PDO		S-1STOP REAR PDO
OREGON DEFARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION TRANSPORTATION DATA SECTION - CRASH AMALYSIS AND REPORTING UNIT CONTINUOUS SYSTEM (RASH LISTING 10th Avenue at Adair Street (Rt 8, Hwy 29) in Cornelius 1999 - 2003	INT-REL OFFRD WTHR TRAF- RNDBT SURF CNTL DRVWY LIGHT		N N N RAIN TRF SIGNAL N WET N DAY		N N CLR TRF SIGNAL N DRY N DAY		N N CLR TRF SIGNAL N DRY N DAY		N N CLD TRF SIGNAL N DRY N DAY		N N CLR TRF SIGNAL N DRY N DUSK
DEPARTMENT TRANSPORTA: 10th Ave	INT-TYP (MEDIAN) LEGS (#LANES)	:	CROSS		CROSS		CROSS		CROSS		CROSS
OREGON	RD CHAR DIRECT LOCTN		INTER CN 01		INTER CN 02		INTER CN 02		INTER CN 02		INTER CN 02
	T CONN # YP FIRST STREET NT SECOND STREET		N ADAIR ST 68 N 10TH AVE		N ADAIR ST 16.68 N 10TH AVE		N ADAIR ST 68 N 10TH AVE		N ADAIR ST 68 N 10TH AVE		N ADAIR ST 68 N 10TH AVE
	CLASS COMPNT MLG TYP MILEPNT		14 0 0 16.68		14 0 0° 16.		14 0 0 16.68		14 0 0 16.68		14 0 0 16.68
	COUNTY CITY URBAN AREA		N N N 11/05/2000 WASHINGTON Sun CORNELIUS 2P PORTLAND UA		N N N N 03/26/1999 WASHINGTON Fri CORNELIUS 2P PORTLAND UA		N N 08/03/1999 WASHINGTON Tue CORNELIUS 4P PORTLAND UA		N N 02/20/2000 WASHINGTON Sun CORNELIUS LIA PORTLAND UA		N N N N O 05/03/2000 WASHINGTON Red CORNELIUS 5P FORTLAND UA
4/11/2005 N VALLEY	D B S W C O DATE G H R DAY S L K TIME		N N N 11/05/: Sun 2P		N N N 03/26/. Fri 2P		Z		N N N 02/20/2 Sun 11A		N N N 05/03/2 Wed 5P
CDS380 4/11/200	S P P SER#. E L INVEST D C		10105 N N CITY		02527 N N NO RPT		06428 N N CITY		01554 N N N CITY		03829 N N NONE

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION	RANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT	CONTINUOUS SYSTEM CRASH LISTING
OREGON DEPARTMENT OF	TRANSPORTATION	ŏ

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10.097/2010 GARGEREGON 14 10.05 1.0 1.	ATE SAY TIME		RD CHAR DIRECT LOCIN	INT-TYP (MEDIAN) LEGS (#LANES)	1999 INT-REL OFFRD WTI TRAF- RNDBT SUI CNTL DRVWY LI	- 2003 - 2003 - CRASH RF COLL GHT SVRTY	VEHICLE USE-TRLR OWNER V# TYPE	MOVE FROM TO	PRTC	A S G E LICNS E X RES	ERROR	ACT EVENT	CAUSE
Part Part						l .	NONE PRVTE PSNGR	Lω		48 F OR-Y OR<25	000		00
Note 1 Note 1	N N N 10/09/2003 Thu 7P	14 1 A 0 16.67	INTER CN 01	CROSS 0	222		NONE PRVTE PSNGR			fa.	000	000	00 00
Part Part							NONE PRVTE PSNGR			Σ	004,028	000	00
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N N N 02/08/1999 WASHINGTON 14 INTER CROSS N N N RAIN ANGL-OT 1 NOWE O STRGHT Son CORNELIUS 1 BASELINE ST CN TRF SIGNAL N WET ANGL FRYTE W E BA PORTLAND UA 0 16.67 10TH AVE 04 0 NDAWN PDO FSNGR CA 1 DRV NOWE 54 F OR-Y OR<25							NONE PRVTE PSNGR			×	020	000	40
	N N N N 02/08/1999 Mon 8A	14 1 0 16.67	INTER CN 04		zzz					(Le	. 000	000	04

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT CONTINUOUS SYSTEM CRASH LISTING 10th Avenue at Adair Street (Rt 8, Hwy 29) in Cornelius 11999 - 2003	CRASH USE-TRIA MOVE A S COLL OWNER FROM PRIC INJ GELICUS PED TYPE TO PFTCE INJ GELICUS PED COLL OWNER FOOM PFTCE SURTY EX RES LOC ERROR ACT EVENT CAUSE	2 NONE O STRGHT PRUTE S N PSNGR CA 1 DRV NONE 42 M OR-Y 020 04 OR<25	ANGL-OT 1 NOME 0 STRGHT ANGL PRYTE W E 000 INJ PSNGR CA 1 DRV NONE 43 M OTH-Y 020 N-RES N-RES	2 NONE 1 STRGHT PRIVE S N PSNGR CA 1 DRV NONE 33 M OR-X 000 06<25 2 PSN INJC 28 F 3 PSN INJC 28 M 4 PSN INJC 22 M		2 NONE 0 STRGHT PRVTE S N PSNGR CA 1 DRV NONE 34 M OR-Y 000 OR<25	3 NONE 0 STOP PRVTE N S PSNGR CA 1 DRV NONE 47 M OR-Y 000 OR<25	ANGL-OT 1 NONE 0 STRGHT ANGL PRVTE S N INJ PSNGR CA 1 DRV INJC 45 M OR-Y 000 OR<25	2 NOME 0 STRGHT	3 NONE O PRKD-P PRVTE W E PSNRR CA
	-				026			000		800
	S E LICNS PED X RES LOC	2	M OTH-Y N-RES	M OR-Y OR<25 F	F OR-Y OR<25	S	ν.	ν.	ν.	
FINC	PRIC	1 DRV	1 DRV	1 DRV 2 PSN 3 PSN 4 PSN	1 DRV	1 DRV	DRV	1 DRV	1 DRV	
IS AND REPORTING ((NG) in Cornelius	VEHICLE USE-TRLR OWNER TYPE	NONE 0 PRVTE PSNGR CA	NONE 0 PRVTE PSNGR CA	NONE 1 PRVTE PSNGR CA	NONE 0 PRVTE PSNGR CA	NONE 0 PRVTE PSNGR CA	NONE () STOP PRVTE N PSNGR CA	NONE 0 PRVTE PSNGR CA	NONE 0 PRVTE PSNGR CA	NONE 0 PRVTE
N DATA SECTION - CRASH ANALYSIS CONTINUOUS SYSTEM CRASH LISTING at Adair Street (Rt 8, Hwy 29) 1999 - 2003	CRASH COLL SVRTY	2	E.O.	2	ANGL-OT ANGL INJ	2	n	ANGL-OT ANGL INJ	8	m
TION DATA SECTIO CONTINUOUS SY enue at Adair Str	INT-TYP (MEDIAN) INT-REL OFFRD WTHR LGGS TRAF- RNDBF SURF (#LANES) CNTL DRVWY LIGHT		N N CI TRF SIGNAL N DE N DE		N N CLR TRF SIGNAL N DRY N DAY			N N CLD TRF SIGNAL N WET N DAY		
TRANSPORTF 10th Ave	INT-TYP RD CHAR (MEDIAN) DIRECT LEGS LOCTN (#LANES)		ER CROSS		ER CROSS			ER CROSS		
	STREET STREET		INTER BASELINE ST CN 10TH AVE 04		INTER LINE ST CN 10TH AVE 04			BASELINE ST CN N 10TH AVE 04		
	CLASS COMPUT COMPUT MLG TYP FIRST MILEPNT SECOND		14 1 BASE 0 16.67 10		14 1 BASELINE ST 0 16.67 N 10TH AV			14 1 BASE 0 16.67 N		
	COUNTY CITY URBAN AREA		00 WASHINGTON CORNELIUS PORTLAND UA		01 WASHINGTON CORNELIUS PORTLAND UA			01 WASHINGTON CORNELIUS PORTLAND UA		
029 TUALATIN VALLEY	S D W R S W E A U C O DATE E L G H R DAY D C S L K TIME		N N N N 08/23/2000 WASHINGTON Ned CORNELIUS 6P PORTLAND U.		N N N N 03/19/2001 WASHINGTON MON CORNELIUS 7A PORTLAND U			N N N N 04/07/2001 WASHINGTON Sat CORNELLUS SP PORTLAND U		
029 TUA	SER#. INVEST		07727 CITY		02252 CITY			02812 CITY		

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OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT URBAN NON-SYSTEM CRASH LISTING
10th Avenue at Adals Street (Rt 8, Hwy 29) in Cornelius
1999 - 2003

CAUSE	10		10				
ACT EVENT		000				011	
ERROR			011				000
MOVE A S FROM PRIC- G E LICNS PED TO PHTYPE INJ E X RES LOC			DRV NONE 31 M OR-Y	OR<25			1 DRV NONE 41 F OR-Y
MOVE FROM P# T	BACK	z	1 0		STOP	S	
VEHICLE USE /TRLR MC OWNER FI V# TYPE TO	NONE 0	PRVTE S	PSNGR CA		2 NONE 0 ST	PRVTE N	PSNGR CA
CRASH INT-REL OFF-RD WTHR TYPE TRAF- RNDBT SURF COLL CONTL DRVWY LIGHT SEV	N CLR 0-1STOP 1	TRF SIGNAL N DRY BACK	N DAY PDO				
INT-TYP (MEDIAN) LEGS (#LANES)	CROSS		. 0				
ROAD- CHAR DIRECT LOCTN	INTER	z	90				
CITY STREET FIRST STREET SECOND STREET	N ADAIR ST	N 10TH AVE					
CLASS DIST FROM INTERSECT	16	0					
P R S W SER#. E L G H R DAT INVEST D C S L K TIME	01173 N N N N 02/08/2000	NONE	4.5				

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OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT CRASH SUMMARIES BY YEAR BY COLLISION TYPE 10th Avenue at Baseline Street (Rt 8, Hwy 29) in Cornelius 1999 - 2003

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COLLISION TYPE	FATAL	FATAL FATAL CRASHES CRASHES	DAMAGE ON Y	TOTAL	PEOPLE	PEOPLE	SX.	DRY	WET	\ \	אשעט	INTER-	SECTION	Ž C
YEAR: 1999						23,100						2010	1	ı۱
ANGLE	0	0	*-	-	0	0	0	0	-	0	•	•	C	
1999 TOTAL	0	0	_	-	0	0	0	0		0	-	· -	0	
YEAR: 2000														
ANGLE	0	-	0	_	0	က	0		0	-	0	-	0	
TURNING MOVEMENTS	0	0	_	-	0	0	0	-	0	-	0	_	0	
2000 TOTAL	0	_	-	2	0	က	0	7	0	7	0	2	0	
YEAR: 2001														
ANGLE	0	2	0	2	0	2	0	-	-	2	0	2	С	
REAR-END	0	-	0	_	0	-	0	· -	0	· C	· «-	٠-	· C	
TURNING MOVEMENTS	0	0	-	-	0	0	0	τ-	0	· -	0	•	0	
2001 TOTAL	0	က	-	4	0	က	0	ო	-	က	-	4	0	
YEAR: 2002														
REAR-END	0	_	0	~	0	Ψ-	0	-	0	0	-	-	0	
2002 TOTAL	0		0	-	0	-	0	-	0	0	-	-	0	
FINAL TOTAL	0	Ŋ	က	80	0	۷	0	9	2	ß	က	80	0	

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029 TUALATIN VALLEX					Oth Avenu	e at Baselino	s Street 1999 - 20	(Rt 8, Hwy)03	, 29) in Co	nelius					
S D W P R C O DATE E M G H R DAY INVEST D C S L K IME	COUNTY CITY URBAN AREA	CLASS COMPNT MLG TYP MILEPNT	CONN # FIRST STREET SECOND STREET	RD CHAR DIRECT LOCTN	INT-TYP (MEDIAN) INT-REL LEGS TRAF- (#LANES) CNTL	REL	OFFRD WTHR RNDBT SURF DRVWY LIGHT	CRASH COLL SVRTY	VEHICLE USE-TRLR OWNER V# TYPE	MOVE FROM TO	PRTC P# TYPE	INJ	A S G E LICNS PED E X RES LOC	ERROR	ACT EVENT
07117 N N N N N 08/17/2001 WASHINGTON CITY Fri CORNELIUS 6P PORTLAND U	WASHINGTON CORNELIUS PORTLAND UA	14 0 0 16.67	BASELINE ST N 10TH AVE	INTER CN 02	CROSS 0	N N ONE-WAY N	CLR DRY DAY	S-1TURN TURN PDO	1 NONE 0 PRVTE PSNGR CA	TURN-L W N	1 DRV	NONE	30 M OR-Y OR<25	000	000
									2 NONE 0 PRVTE PSNGR CA	STRGHT W E	1 DRV	NONE	54 F OR-Y OR>25	003	000
85142 N N N N N 03/23/2001 WASHINGTON NONE Exi CORNELIUS 5P PORTLAND U.	WASHINGTON CORNELIUS PORTLAND UA	14 1 0 16.67	BASELINE ST 10TH AVE	INTER E 06	CROSS 0	N TRF SIGNAL N	CLR DRY DUSK	S-1STOP REAR INJ	1 NONE 0 PRVTE PSNGR CA	STRGHT E W	1 DRV	NONE	OO M UNK UNK	026	000
									2 NONE 0 PRVTE PSNGR CA	STOP E W	1 DRV	INGC	24 M OR-Y OR<25	000	011
01598 N N N N 02/24/2002 WASHINGTON NONE SUN CORNELIUS 6P PORTLAND UJ	WASHINGTON CORNELIUS PORTLAND UA	14 1 0 16.67	BASELINE ST 10TH AVE	INTER W 06	CROSS	N TRF SIGNAL N	CLR DRY DUSK	S-1STOP REAR INJ	1 NONE 0 PRVTE PSNGR CA	STRGHT W E	1 DRV	NONE	16 F OR-Y OR<25	026	000
									2 NONE 0 PRVTE PSNGR CA	STOP W E	1 DRV	INGC	43 F OR-Y OR<25	000	012
05861 N N N N O6/29/2000 WASHINGTON NONE Thu CORNELUS 6P PORTLAND U)	WASHINGTON CORNELIUS PORTLAND UA	14 1 0 16.67	BASELINE ST 10TH AVE	INTER CN 03	CROSS 0	N ONE-WAY N	CLR DRY DAY	S-OTHER TURN PDO	1 NONE 1 PRVTE PSNGR CA	TURN-R W S	1 DRV	NONE	OO M UNK UNK		000
									2 NONE 0 PRVTE PSNGR CA	TURN-R W S	1 DRV	NONE	38 M OR-Y OR<25	000	000
U1079 N N N N 02/08/1999 WASHINGTON 90NE 90N BA PORTIAND U)	, WASHINGTON CORNELIUS PORTLAND UA	14 1 0 16.67	BASELINE ST 10TH AVE	INTER CN 04	CROSS	N TRF SIGNAL N	RAIN WET DAWN	ANGL-OT ANGL PDO	1 NONE 0 PRVTE PSNGR CA	STRGHT W E	1 DRV	NONE	54 F OR-Y OR<25	000	000
									2 NONE 0 PRVTE	STRGHT S N	ויייייייייייייייייייייייייייייייייייייי	ENCN	2 4 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		700

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TRANSPORTATION DATA SECTION - CRASH ANAL
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029 TUALATIN VALLEY

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ANSPORRATION DEVELOPMENT DIVISION H ANALYSIS AND REPORTING UNIT STARL LIGHTING E. 8, Hwy 29) in Cornelius	VEHICLE
OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELCHMENT DIVISION TRANSPORTATION - CASH ANALYSIS AND REPORTING UNIT CONTINUOUS SYSTEM CRASH LIGHTNG CONTINUOUS SYSTEM (RASH LIGHTNG 10th Avenue at Baseline Street (Rt 8, Hwy 29) in Cornelius 1999 - 2003	INT-TYP
OREGON	
	CLASS

CAUSE	04		04			04
ACT EVENT	000	000	013	900	011	000
ERROR	020	000	020	000	000	000
A S G E LICNS PED E X RES LOC	43 M OTH-Y N-RES	33 M OR-Y OR<25 28 F 28 M 32 M	82 F OR-Y OR<25	34 M OR-Y OR<25	47 M OR-Y OR<25	45 M OR-Y OR<25
E PRTC INJ M P# TYPE SVRTY	GHT E 1 DRV NONE	6HT N 1 DRV NONE 2 PSN INJC 3 PSN INJC 4 PSN INJC	1 DRV	GHT N 1 DRV NONE	P S 1 DRV NONE	GHT N 1 DRV INJC
LE RLR MOVE FROM TO	0 STRGHT W E CA	1 STRGHT S N CA	O STRGHT W E CA	O STRGHT S N CA	O STOP N S	O STRGHT S N CA
VEHICLE USE-TRLR OWNER V# TYPE	1 NONE 0 PRVTE PSNGR CA	2 NONE 1 PRVTE PSNGR CA	1 NONE 0 PRVTE PSNGR CA	2 NONE 0 PRUTE PSNGR CA	3 NONE 0 PRVTE PSNGR CA	1 NONE 0 PRVTE PSNGR CA
CRASH COLL SVRTY	ANGL-OT ANGL INJ		ANGL-OT ANGL INJ			ANGL-OT ANGL INJ
INT-REL OFFRD WTHR TRAF- RNDBT SURF CNTL DRVWY LIGHT	N N CLR TRF SIGNAL N DRY N DAY		N N CLR TRF SIGNAL N DRY N DAY			N N CLD TRF SIGNAL N WET N DAY
INT-TYP (MEDIAN) INT-REL LEGS TRAF- (#LANES) CNTL	CROSS TI		CROSS TI			CROSS TI
RD CHAR DIRECT LOCTN	INTER CN 04		INTER CN 04			INTER CN 04
CLASS COMPNT CONN # MLG TYP FIRST STREET MILEPNT SECOND STREET	14 1 BASELINE ST 0 16.67 10TH AVE		14 1 BASELINE ST 0 16.67 N 10TH AVE			14 1 BASELINE ST 0 16.67 N 10TH AVE
COUNTY CITY URBAN AREA	N 08/23/2000 WASHINGTON Med CORNELLUS 6P PORTLAND UA		001 WASHINGTON CORNELIUS PORTLAND UA			_
S D W P R S W E A U C O DATE SER#. E L G H R DAY INVEST D C S L K INE	07727 N N N N N 08/23/20 CITY Wed		02252 h n n n n 03/19/2001 WASHINGTON CITY Aon PORTLAND US 7A PORTLAND US			02812 N N N N N 04/07/2001 WASHINGTON CITY SAL CORNELLOS 5P PORTLAND UA

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Code	Short Description	Medium Description	Long Description
8 6	SKIDDED	SKIDDED	No action or non-warranted Skirided
005	ON/OFF V	ON/OFF STOP VEH	Getting on or off stopped or parked vehicle
003	LOAD OVR	OVRHING STR OBJ	Overhanging load struck another vehicle, etc.
900	SLOW DN	SLOWED DOWN	Slowed down
200	AVOIDING	AVOIDING MANV	Avoiding maneuver
800	PAR PARK	PARALLEL PKNG	Parallel parking
600	ANG PARK	ANGLE PKNG	Angle parking
010	INTERFER	PSNGR INTERFERED	Passenger interfering with driver
011	STOPPED	STP IN TRAF/ NO LFT	Stopped in traffic not waiting to make a left turn
012	STP/L TRN	STP FOR LFT TURN	Stopped because of left turn signal or waiting, etc.
013	STP TURN	STP WHILE TURNING	Stopped while executing a turn
015	GO A/STOP	PROCEED A/STOPPING	Proceed after stopping for a stop sign/flashing red.
910	TRN A/RED	STOP/TURN ON RED	Turned on red after stopping
210	LOSTCTRL	LOST CONTROL	Lost control of vehicle
910	EXIT DWY	ENT FRM ALLEY/DRWY	Entering street or highway from alley or driveway
019	ENTR DWY	ENT ALLEY FROM RD	Entering alley or driveway from street or highway
020	STR ENTR	STR OBJ BF/ENT	Before entering roadway, struck pedestrian, etc. on sidewalk or shouider
021	NO DRVR	DRIVERLESS VEHICLE	Car ran away - no driver
022	PREV COL	STK OBJ PRIOR COL	Struck, or was struck by, vehicle or pedestrian in prior collision before acc. stabiliz
023	STALLED	VEHICLE STALLED	Vehicle stalled
024	DRVR DEA	DRVR DEAD BF CRASH	Dead by unassociated cause
025	FATIGUE	DRIVER ASLEEP	Fatigued, sleepy, asleep
970	SUN	BLINDED BY SUN	Driver blinded by sun
027	HDLGHTS	BLINDED / HEADLIGHTS	Driver blinded by headlights
028	ILLNESS	PHYSICAL ILLNESS	Physically ill
029	THRU MED	PLUNGED OVER MEDIAN	Vehicle crossed, plunged over, or through median barrier
030	PURSUIT	PURSUING OTHER VEH	Pursuing or attempting to stop another vehicle
031	PASSING	PASSING	Passing situation
032	PRKOFFRD	PARKED OFF RD	Vehicle parked beyond curb or shoulder
033	CROS MED	VEH CROSSED MED	Vehicle crossed earth or grass median
034	X N/SGNL	X-INTER NO SIGNAL	Crossing at intersection - no traffic signal present
035	X W/ SGNL	X-INTER W/ SIGNAL	Crossing at intersection - traffic signal present
920	DIAGONAL	X-INTER DIAGONAL	Crossing at intersection - diagonally
037	BTWN INT	X-BTWN INTER	Crossing between intersections
038	DISTRACT	DISTRACTED	Driver's attention distracted
039	W/TRAF-S	WALK SHLDR W/TRAFF	Walking, running, riding, etc., on shoulder WITH traffic
040	A/TRAF-S	WALK SHLDR A/TRAFF	Walking, running, riding, etc., on shoulder FACING traffic
041	W/TRAF-P	WALK PAVE W/TRAFF	Walking, running, riding, etc., on pavement WITH traffic
042	A/TRAF-P	WALK PAVE A/TRAFF	Walking, running, riding, etc., on pavement FACING traffic
043	PLAYINRD	PLAYING IN RDWY	Playing in street or road
044	PUSH MV	PUSH/WORK MV IN RD	Pushing or working on vehicle in road or on shoulder
045	WORK ON	WORK ON ROAD	Working in roadway or along shoulder
020	LAY ON RD	STAND/LYING IN RD	Standing or lying in roadway
051	ENT OFFR	ENTER FROM OFF ROAD	Entering / starting in traffic lane from off-road
088	OTHER	OTHER	Other action
660	UNK	UNKNOWN	Unknown action

Long Description	No cause associated at this level	Speed too fast for conditions	Did not yield right-of-way	Passed stop sign or red flasher	Disregarded R-A-G traffic signal.	Drove left of center on two-way road	Improper overtaking	Followed too closely	Made improper turn	Alcohol or Drug Involved	Other improper driving	Mechanical defect	Other (not improper driving)	Improper change of traffic lanes	Vehicle improperly parked	Defective steering mechanism	inadequate or no brakes	Vehicle lost load or load shifted	Tire Failure	Phantom / Non-contact Vehicle	Inattention
Medium Description	NO CODE APPLICABLE	TOO FAST FOR COND	FAILED YIELD ROW	PASSED STOP SIGN	DISREGARD R-A-G	DROVE WRONG SIDE	IMPROPER PASSING	FOLLOW TOO CLOSE	IMPROPER TURN	ALC OR DRUGS	OTHER DRIVE ERR	MECH DEFECT	OTHER	IMP LANE CHANGE	IMPROPER PARKING	DEFECTIVE STEERING	DEFECTIVE BRAKES	LOAD SHIFTED	TIRE FAILURE	PHANTOM VEHICLE	INATTENTION
Short Description	NO CODE	TOO-FAST	NO-YIELD	PAS-STOP	DIS-RAG	LEFT-CTR	IMP-OVER	TOO-CLO	IMP-TURN	DRINKING	OTHR-IMP	MECH-DE	OTHER	IMP LN C	IMP PKNG	DEF STER	DEF BRKE	LOADSHF	TIREFAIL	PHANTOM	INATTENT
Code	00	10	05	03	04	90	90	20	90	60	10	F	12	13	20	21	22	24	25	56	27

(65 CO)

Code	Short Description	Medium Description	Long Description
000	NONE	NO ERROR	No error
100	WIDE TRN	WIDE TURN	Wide turn
005	CUT CORN	CUT CORNER	Cut corner on lum
003	FAIL TRN	F OBEY TRN	Failed to obey mandatory traffic tum signal, sign or lane markings
904	L IN TRF	LTRN FNT TRAF	Left turn in front of oncoming traffic
900	L PROHIB	LTRN PROHIB	Left turn where prohibited
900	FRM WRNG	T FRM WRNG LN	Turned from wrong lane
200	TO WRONG	T TO WRONG LN	Turned into wrong lane
800	ILLEG U	ILLEG U-TURN	U-turned illegally
600	IMP STOP	IMP STOP	Improperly stopped in traffic lane
010	IMP SIG	IMP/FAIL SIG	Improper signal or failure to signal
110	IMP BACK	IMP BACKING	Backing improperly (Not parking)
012	IMP PARK	IMP PARKED	Improperly parked
013	UNPARK	IMP STRT PARK	Improper start leaving parked position
014	IMP STRT	IMP STRT STOP	Improper start from stopped position
015	IMP LGHT	IMP/NO LIGHTS	Improper or no lights (vehicle in traffic)
910	NO DIM	NO DIM LIGHTS	Failed to dim lights (until 4/1/97) / Inattention (after 4/1/97)
017	UNSF VEH	DR UNSAFE VEH	Driving unsafe vehicle (no other error apparent)
910	OTH PARK	PRK MAN N/CLR	Entering, exiting parked position with insufficient clearance or other improper parking maneuve
019	DIS DRIV	DISRG DR SIG	Disregarded other driver's signal
020	DIS SGNL	DISRG TRF SIG	Disregarded traffic signal
021	RAN STOP	DISRG STP SGN	Disregarded stop sign or flashing red
022	DIS SIGN	DISRG WRN SGN	Disregarded warning sign, flares or flashing amber
023	DIS OFCR	DISRG POL/FLG	Disregarded police officer or flagman
024	DIS EMER	DISRG SIR/EMR	Disregarded siren or warning of emergency vehicle
025	DIS RR	DISRG RR SIG	Disregarded RR signal, RR sign, or RR flagman
970	REAR-END	F AVOID STP V	Failed to avoid stopped or parked vehicle ahead other than school bus
027	BIKE ROW	F/YLD ROW BIK	Did not have right-of-way over pedalcyclist
028	NO ROW	NO R-O-W	Did not have right-of-way
670	PED ROW	F/YLD ROW PED	Failed to yield right-of-way to pedestrian
030	PAS CURV	PASS ON CURVE	Passing on a curve
031	PAS WRNG	PASS WRNG SID	Passing on the wrong side
032	PAS TANG	PASS TANGENT	Passing on straight road under unsafe conditions
033	PAS X-WK	PASS STP4PED	Passed vehicle stopped at crosswalk for pedestrian
034	PAS INTR	PASS AT INTER	Passing at intersection
035	PAS HILL	PASS ON HILL	Passing on crest of hill
036	N/PAS ZN	PASS N/PASSNG	Passing in "No Passing" zone
037	PAS TRAF	PASS ONC TRAF	Passing in front of oncoming traffic
038	CUT-IN	CUTTING IN	Cutting in (two lanes - two way only)
039	WRNGSIDE	DR WRONG SIDE	Driving on wrong side of the road
040	THRU MED	DR THRU MEDN	Driving through safety zone or over island
,	0.10	or in the or or or or	

043	TO CLOSE	FOLLW TO CLOS	Following too closely (Must be on Officer's Report)
044	STRDL LN	STRD/DR WRNG	Straddling or driving on wrong lanes
045	IMP CHG	IMP LANE CHG	Improper change of traffic lanes
940	WRNG WAY	WRNG WY/1 WA	Wrong way on one-way roadway (Vehicle is deliberately traveling on wrong side)
047	BASCRULE	V BASIC RULE	Driving too fast for conditions (Not excessive speed)
048	OPN DOOR	OPN DOOR TRAF	Opened door into adjacent traffic lane
049	F/MT SPD	F MAINT SPEED	Citation issued for "Failure to maintain reasonable speed"
020	SPEED	SPEED	Excessive Speed
051	RECKLESS	RECKLSS DRVN	Reckless driving
052	CARELESS	CARELSS DRVN	Careless driving
054	X N/SGNL	X-INT NO SGNL	Crossing at intersection – no traffic signal present
055	X W/SGNL	X-INT W/ SGNL	Crossing at intersection – traffic signal present
920	DIAGONAL	X-INT DIAGNL	Crossing at intersection - diagonally
250	BTWN INT	X-BTWN INTER	Crossing between intersections
059	W/TRAF-S	W SHLD W/TRAF	Walking, running, riding, etc., on shoulder WITH traffic
090	A/TRAF-S	W SHLD A/TRAF	Walking, running, riding, etc., on shoulder FACING traffic
061	W/TRAF-P	W PAVE W/TRAF	Walking, running, riding, etc., on pavement WITH traffic
062	A/TRAF-P	W PAVE A/TRAF	Walking, running, rlding, etc., on pavement FACING traffic
063	PLAYINRD	PLAY IN RDWY	Playing in street or road
064	PUSH MV	PUSH MV IN RD	Pushing or working on vehicle in road or on shoulder
990	WK IN RD	WORK IN RD	Working in roadway or along shoulder
070	LAYON RD	LYING IN RD	Standing or lying in roadway
073	DIS POL	DISRG POL/FLG	Disregarding Police (eluding)
080	FAIL LN	F MAINT LANE	Failed to maintain lane
081	OFF RD	RAN OFF RD	Ran off road
082	NO CLEAR	MISJUDGE CLR	Driver misjudged clearance
083	OVRSTEER	OVERSTEER	Over Correcting
084	INATTENT	INATTENTION	Inattention (4/1/1997)
982	OVRLOAD	OVERLOAD	Overloading or improper loading of vehicle with cargo or passengers
260	UNA DIS TC	UNA DISRG TCD	Unable to determine which driver disregarded traffic control device

Failed to decrease speed for slower moving vehicle

F/SLO SLO VEH

F/SLO MV

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(A)

	Occupant falt, jumped or was ejected from moving vehicle	Passenger interfered with driver	Animal or insect in vehicle interfered with driver	Pedestrian involved (Non-pedestrian accident)	'Sub-Ped": pedestrian injured subsequent to collision, etc.	fricycle-Bicycle involved	Hitchhiker (soliciting a ride)	Passenger being towed or pushed on conveyance	Getting on or off stopped or parked vehicle (occupants only)	Overturned after first harmful event	g bushed	Vehicle towed or had been towing another vehicle	Vehicle forced by impact into another vehicle, pedalcyclist or pedestrian	Vehicle set in motion by non-driver (child released brakes, etc.)	At or on railroad right-of-way (not Light Rail)	At or on Light-Rail right-of-way	vehicle	ck train	Vehicle struck railroad car on roadway	Jackknife; trailer or towed vehicle struck towing vehicle	Trailer or towed vehicle overturned	Trailer connection broke	Detached trailing object struck other vehicle, non-motorist, or object	Vehicle door opened into adjacent traffic lane	#oe	Q.	Lost load, load moved or shifted		g and similar	Stock: cow, calf, bull, steer, sheep, etc.	s, or donkey	ider	Wild animal, game (includes birds; not deer or elk)	wapiti	vn vehicle	Culvert, open low or high manhole	nuator	ler	Curb (also narrow sidewalks on bridges)	Jiggle bars or traffic snake for channelization
Long Description	Occupant fell	Passenger in	Animal or ins	Pedestrian in	"Sub-Ped": p	Tricycle-Bicy	Hitchhiker (so	Passengerb	Getting on or	Overturned a	Vehicle being pushed	Vehicle tower	Vehicle force	Vehicle set in	At or on railro	At or on Ligh	Train struck vehicle	Vehicle struck train	Vehicle struc	Jackknife; tra	Trailer or tow	Trailer conne	Detached tra	Vehicle door	Wheel came off	Hood flew up	Lost load, loa	Tire Failure	Pet: cat, dog and similar	Stock: cow, c	Horse, mule, or donkey	Horse and rider	Wild animal,	Deer or elk, wapiti	Animal-drawn vehicle	Culvert, open	Impact attenuator	Parking meter	Curb (also n	Jiggle bars or
Medium Description	FELL/JUMPED MV	PSNGR INTERFERED	ANML INTERFERED	PED INVOLVED	SUBSEQUENT PED	PEDALCYCLE INV	HITCHHIKER	PSNGR TOWED	ON/OFF STOP VEH	SUBSEQ OVERTURN	VEH BEING PUSHED	VEH TOWED/TOWING	FORCED BY IMPACT	MV SET IN MOTION	RAILROAD ROW	LIGHT RAIL ROW	TRAIN HIT VEH	VEH HIT TRAIN	VEH HIT RR CAR	JACKKNIFE	TRAILER O'TURN	TRLR CONN BROKE	DETCHD TRLR STRKNG	V DOOR OPN IN TRAF	WHEEL CAME OFF	HOOD FLEW UP	LOAD SHIFTED	TIRE FAILURE	PET	LIVESTOCK	HORSE	HORSE & RIDER	GAME NO DEER/ELK	DEER OR ELK	ANIMAL-DRAWN VEH	CULVERT/MANHOLE	IMPACT CUSHION	PARKING METER	CURB	JIGGLE BAR N/MED
Short Description	FELJUMP	INTERFER	BUG INTF	PED INV	SUB-PED	BIKE INV	HITCHIKR	PSNGR TOW	ON/OFF V	SUB OTRN	MV PUSHD	MV TOWED	FORCED	SET MOTN	RR ROW	LT RL ROW	RR HIT V	V HIT RR	HIT RR CAR	JACKNIFE	TRL OTRN	CN BROKE	DETACH TRL	V DOOR OPN	WHEELOFF	HOOD UP	LOAD SHIFT	TIREFAIL	PET	LVSTOCK	HORSE	HRSE&RID	GAME	DEER ELK	ANML VEH	CULVERT	ATENUATN	PK METER	CURB	JIGGLE
Code	100	005	003	004	900	900	200	800	600	010	110	012	013	014	015	016	017	018	019	020	021	022	023	024	025	970	028	029	030	031	032	033	034	035	036	037	038	039	040	041

	Guard rail (not metal median barrier)	Median barrier (raised or metal)	Retaining wall or tunnel wall	Bridge railing (on bridge and approach)	Bridge abutment (approach ends)	Bridge pillar or column (even though struck protective guard rail first)	Bridge girder (horizontal structure overhead)	Traffic raised island	Gore	Pole – type unknown	Pole power or telephone	Pole – street light only	Pole – traffic signal and ped signal only	Pole – sign bridge	Stop or yield sign	Other sign, including street signs	Hydrant	Delineator or marker (reflector posts)	Mailbox	Tree, stump or shrubs	Tree branch or other vegetation overhead, etc.	Wire or cable across or over the road	Temporary sign or barricade in road, etc.	Permanent sign or barricade in/off road	Slides, rocks off or on road, falling rocks	Foreign obstruction/debris in road (not grave!)	Equipment working in/off road	Other equipment in or off road (includes parked trailer, boat)	Wrecker, street sweeper, snow plow or sanding equipment	Rock, brick or other solid wall	Speed bump, other bump, pothold or pavement irregularity	Bridge or road cave in	High Water	Snow Bank	Chuckhole in road, low or high shoulder at pavement edge	Cut slope or ditch embankment	Struck by rock or other object set in motion by other vehicle (incl. lost loads)	Struck by other moving or flying object	Vehicle obscured view	Vegetation obscured view	View obscured by fence, sign, phone booth, etc.	Wind Gust	Vehicle immersed in body of water	Fire or Explosion
GHABDBAH END	GUARDRAIL	MEDIAN BARRIER	WALL	BRIDGE RAIL	BRIDGE ABUTMENT	BRIDGE COLUMN	BRIDGE GIRDER	TRAFFIC ISLAND	GORE	POLE-UNKNOWN	POLE-UTILITY	POLE-ST LIGHT	POLE-TRAF SIGNAL	POLE-SIGN BRIDGE	STOP/YIELD SIGN	OTHER SIGN	HYDRANT	DELINEATOR	MAILBOX	TREE/STUMP	VEGTN OVER RDWY	CABLE ACROSS RD	TEMP SIGN/BARR	PERM SIGN/BARR	SLIDE/ROCKS	FOREIGN OBJECT	EQUIP WORKING	OTHER EQUIPMENT	MAINTNCE EQUIP	OTHER WALL	IRREGULAR PAVEMENT	CAVE IN	HIGH WATER	SNOW BANK	HOLE/RDWY EDGE	CUT SLOPE/DITCH	OBJ FRM OTHR VEH	OTHER MOVING OBJ	VEH OBSCURE VIEW	VEG OBSCURE VIEW	BLD OBSCURE VIEW	WIND GUST	IMMERSION	FIRE/EXPLOSION
CINE	GARDRAIL	BARRIER	WALL	BR RAIL	BR ABUT	BR COLMN	BR GIRDR	ISLAND	GORE	POLE UNK	POLE UTL	ST LIGHT	TRF SGNL	SGN BRDG	STOPSIGN	OTH SIGN	HYDRANT	MARKER	MAILBOX	TREE	VEG OHED	WIRE/CBL	TEMP SGN	PERM SGN	SLIDE	FRGN OBJ	EQP WORK	OTH EQP	MAIN EQP	OTHER WAL	IRRGL PVMT	CAVE IN	HI WATER	SNO BANK	HOLE	DITCH	OBJ F MV	FLY-OBJ	VEH HID	VEG HID	BLDG HID	WIND GUST	IMMERSED	FIRE/EXP
042	043	044	045	046	047	048	049	020	051	052	053	054	. 950	026	057	058	059	090	190	062	063	064	990	990	290	990	690	020	071	072	073	075	920	7.70	970	620	080	180	082	083	084	085	980	087

At or on Street Car/Trolley right-of-way Shoulder gave way	SIREEL CAR KOW SHLDR GAVE	S CAR ROW	113
Street Car/Trolley (on rails and/or overhead wire system) struck vehicle Vehicle struck Street Car/Trolley (on rails and/or overhead wire system)	ST CAR STRUCK VEH VEH STRUCK ST CAR	S CAR VS V V VS S CAR	111
Non-motorist struck vehicle	NM STR VEH	N-MTR	110
Pedestrian in motorized wheelchair	MOTORIZED WHEELCHA!	MTR WHLCH	107
Pedestrian in non-motorized wheelchair	NONMOTOR WHEELCHAI	MAN WHLCH	106
Passenger riding on pedalcycle	PSNGR ON PEDALCYCLE	PEDAL PSGR	105
Passenger riding on vehicle exterior	PSGR OUTSIDE VEHICLE	OUTSIDE V	104
Other or unknown object, not fixed	OTHER OBJ NOT FIXED	OTHER OBJ	101
Unknown type of fixed object	UNK FIX OBJ	UNK FIXD	100
Cell Phone use witnessed by other participant	CELLPHONE-WITNSS	CELL-WTN	660
Abrupt edge	ABRUPT EDGE	ABR EDGE	860
Gravel in roadway	GRAVEL IN RDWY	GRAVEL	260
Berm (earthen or gravel mound)	BERM	BERM	960
Guy wire	GUY WIRE	GUY WIRE	960
Teenage driver in violation of graduated license pgm	VIOL GRAD DR LIC	VIOL GDL	094
Cell phone (on PAR or driver in use)	CELLPHONE-POLICE	CELL-POL	093
Other (phantom) non-contact vehicle (on PAR or report)	PHANTOM VEH	PHANTOM	092
Two-way traffic on divided roadway all routed to one side	TWO WAY ONE SIDE	TO 1 SIDE	060
Accident related to another separate accident	REFER OTHER ACDT	OTH ACDT	680
Fence or building, etc.	FENCE/BUILDING	FENC/BLD	088

G-70-10

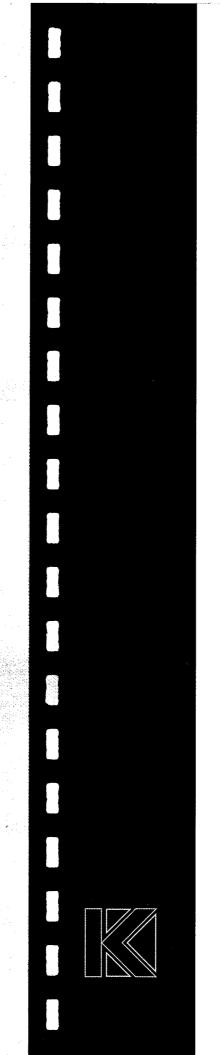
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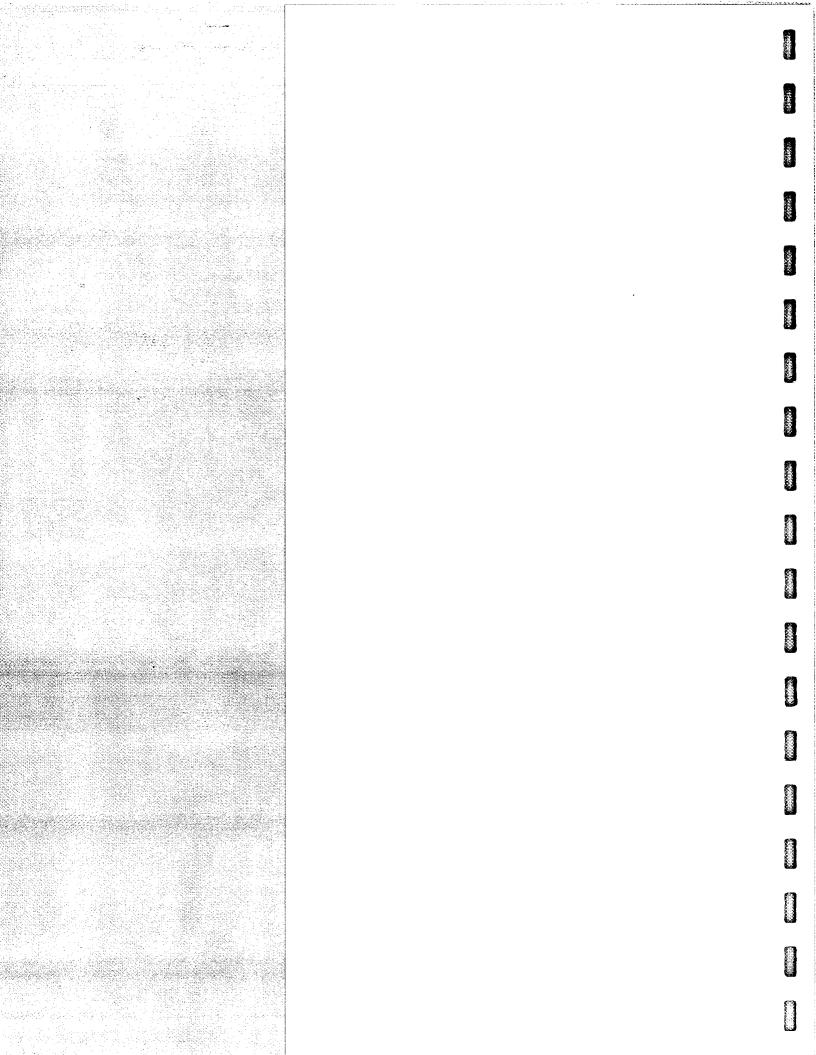
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Manager Residence Same and A Section of the second Standard Company





Appendix F

Traffic Volume Growth Rate Worksheet

				Person in Consistence
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Project 7059 - Cornelius Retail Center

date: July 20, 2005By: CBT

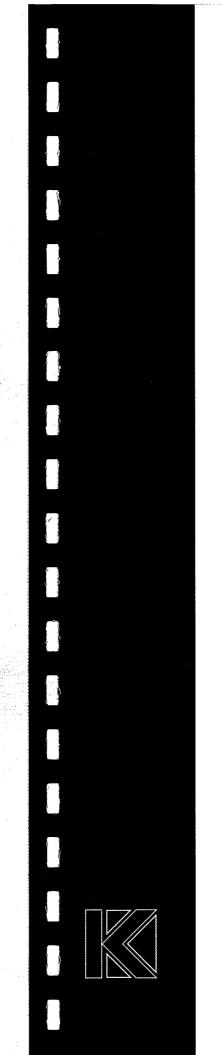
Calculation of Historical Growth Rate -- Appendix E

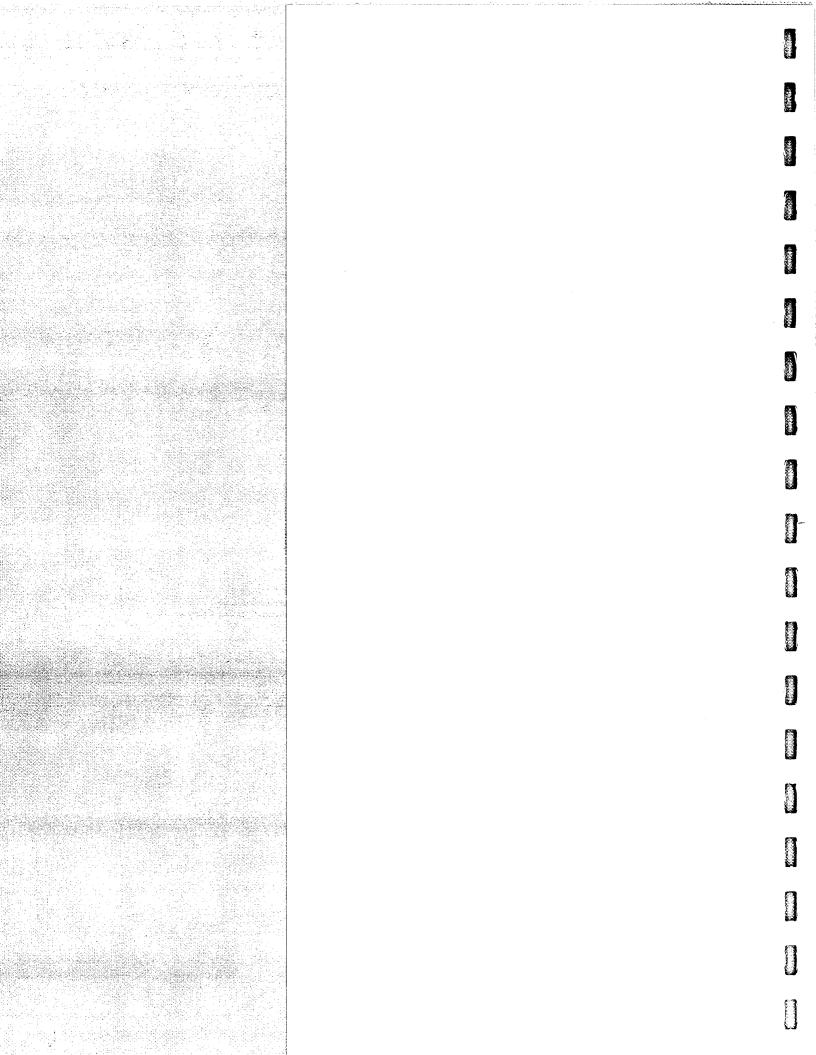
Year	North Adair Street west of North 4th Avenue	Baseline Street west of South 4th Avenue
1994	17,600	17,200
1995	18,300	17,900
1996	18,800	18,400
1997	16,000	16,300
1998	16,200	16,500
1999	16,700	16,700
2000	17,300	17,400
2001	17,700	17,800
2002	18,200	18,200
2003	19,500	19,100

AVERAGE GROWTH PER YEAR (Directional)	1.01	1.01
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LOVERALL AVERAGE	

Month and and W Mariante Section of the second A CALL OF STREET Parket of the second المارية من المراج المارية المارية المارية STONE OF THE Contraction of the Contraction o





Appendix G

Year 2006 Background Traffic Level-of-Service Worksheets

Programme (A) (And a suppose Marinan and Constant and (market) Section of the second section of the section o Francisco Constant Control of the contro Contractor (C) Constants Countries

1	Project # 7059 Cornelius, Oregon Weekday AM Peak Hour Cornelius Wal-Mart Cornelius Wal-Mart Cornelius Wal-Mart Cornelius Wal-Mart Cornelius Wal-Mart Cornelius Wal-Mart	Scenario Report Level Of S	bkam bkam bkam bkam bkam bkam bkam bkam	null # 2 W Baseline St/4th Ave B 10.1 0.605 B 10.2 0.615 + 0.044 D/V	Default Paths # 3 W Baseline St/10th Ave B 13.0 0.657 B 13.1 0.667 + 0.181 D/V	bkam. A 7.0 0.415 A 7.0 0.428 -0.057 D/V	# 5 N Adair St/10th Ave B 11.1 0.428 B 11.2 0.444 + 0.041 D/V	# 6 N Holladay St/10th Ave B 10.6 0.000 B 10.7 0.000 + 0.080 D/V	# 11 Pacific Ave/Quince St C 33.1 0.681 C 33.1 0.681 + 0.000 D/V	# 15 W Basline St/N Yew St C 22.6 0.000 C 23.2 0.000 + 0.519 D/V	# 24 N Adair St/N Yew St C 24.0 0.000 D 25.2 0.000 + 1.233 D/V	# 52 S 4th Ave/S Heather St A 7.3 0.047 A 7.3 0.047 + 0.000 V/C	# 53 S 10th Ave/Dogwood St B 11.2 0.000 B 11.2 0.000 + 0.000 D/V	
'cz 6ny ani		1 1 1 1 4	bkam bkam existing AM Default Impact	eneration: istribution:		Configuration: bkam								reffiv 7 7 1115 (c) 2004 Dowling Assoc. Licensed to

					*		I 4PRINT
Page 4-1	<u>.</u>	****	0.615 10.2 8	West Bound	Permitted Include 0 0 0 0	1.00 1.00 1.00 0.00 0.00 0.00 0.00 0.00	
Tue Aug 23, 2005 14:21:48	& Associates, Inc Project # 7059 ius Wal-Mart Cornelius, Oregon Ind Conditions Weekday AM Peak Hour	Level Of Service Computation Report 2000 HCM Operations Method (Furure Volume Alternative) ************************************	Cycle (sec): 70 Critical Vol./Cap. (X): Loss Time (sec): 8 (Y+R = 4 sec) Average Delay (sec/veh): Optimal Cycle: 38	South Bound East Bound R L - T - R L - T - R	Permitted Permitted Include 0 0 0 0 0 0 0 0 0 0 1 1 0 1 1 0 1 0 1	38 43 0 13 1156 79 1.01 1.01 1.01 1.01 38 43 0 0 0 0 38 43 0 0 0 0 0 38 443 0 0 13 1158 80 0.88 0.88 0.88 0.88 0.88 0.88 44 49 0 15 1352 91 1.00 1.00 1.00 1.00 1.00 1.00 0.63 0.90 1.00 1.00 1.00 1.00 0.63 0.90 1.00 0.077 0.77 0.81 1.00 1.00 0.00 0.077 0.77 0.81 1.00 1.00 0.00 0.077 0.77 0.81 0.04 0.03 0.00 0.47 0.47 0.06 0.12 0.12 0.00 0.47 0.47 0.08 32.8 30.1 0.0 0.61 0.61 0.08 32.8 30.1 0.0 5.0 5.0 2.3 1.00 1.00 1.00 1.00 1.00 32.8 30.1 0.0 5.0 5.0 2.3 2 1.00 1.00 1.00 1.00 32.8 30.1 0.0 5.0 5.0 2.3 32.8 30.1 0.0 5.0 5.0 2.3	Page 2 of 7
bkam	Kittelson & As Cornelius 2006 Background	Level 2000 HCM Operat ************************************	Cycle (sec): 70 Loss Time (sec): 8 (Y	Approach: North Bound	Control: Permitted Rights: Include Min. Green: 0 0 0	Volume Module: Base Vol: Growth Adj: 1.01 1.01 1.01 Initial Bse: 0 74 104 Added Vol: 0 0 0 0 100 Initial Fut: 0 0 0 0 100 PHF Adj: 0.88 0.88 0.88 0.88 Reduct Vol: 0 84 118 Reduct Vol: 0 84 118 Reduct Vol: 0 84 118 Reduct Vol: 0 84 118 Reduct Vol: 0 84 118 Reduct Vol: 0 84 118 Reduct Vol: 0 84 118 SatvLane: 1.00 1.00 1.00 Adjustment: 1.00 0.96 0.81 Lanes: 0.00 1.00 1.00 Adjustment: 1.00 0.96 0.81 Capacity Analysis Module: 0.00 Crit Moves: 0.00 0.37 0.61 Delay/veh: 0.00 0.37 0.61 McMcKavg: 0.00 32.6 42.9 HCMZkAvg: 0.00 32.6 42.9 HCMZkAvg: 0.00 32.6 42.9 AdjDel/veh: 0.0 32.6 42.9 AdjDel/veh: 0.0 32.6 42.9 AdjDel/veh: 0.0 32.6 42.9	
Page 3-1	# 7059 egon Peak Hour	ternative) ************************************	(X): /eh):	ام م	ted Protected ude 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	141 79 786 0 1 1.01 1.01 1.01 1.01 1.01 1.01 1.01	
e Aug 23, 2005 14:21:48	Associates, Inc Project # 7059 Is Wal-Mart Cornelius, Oregon Ind Conditions Weekday AM Peak Hour	f Service Computation Reporns Method (Future Volume Al	Critical Vol./Cap. = 4 sec) Average Delay (sec Level Of Service:	South Bound East Bound	Split Phase Protected Include 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01	7059вкан.сит 8-23-105 2:21p
bkam Tue	Kittelson & Ass Cornelius I 2006 Background (Level Of Service Computation Report 2000 HCM Operations Method (Future Volume Alternative) ************************************	Cycle (sec): 100 Loss Time (sec): 12 (Y+R = 4 sec) Average Delay (sec/ Optimal Cycle: 59	Approach: North Bound Movement: L - T - R	Control: Split Phase Rights: Include Min. Green: 0 0 0 Lanes: 1 0 0 1	Base Vol: Base Vol: Brownh Adi: Initial Bse: Initial Fut: Initial F	86502

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Traffix 7.7.1115 (c) 2004 Dowling Assoc. Licensed to KITTELSON, PORTLAND

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Kittelson & Associates, Inc Project # 7059 Cornelius Wal-Mart Cornelius, Oregon 2006 Background Conditions Weekday AM Peak Hour	Kittelson & Associates, Inc Project # 7059 Cornelius Wal-Mart Cornelius, Oregon 2006 Background Conditions Weekday AM Peak Hour
Level Of Service Computation Report 2000 HCM Operations Method (Future Volume Alternative) ************************************	Level Of Service Computation Report 2000 HCM Unsignalized Method (Future Volume Alternative) ************************************
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Kitt 2006 Backg	Kittelson & Associates, Inc Project # 7059 Cornelius Wal-Mart Cornelius, Oregon 2006 Background Traffic Conditions Weekday PM Peak Hour		Kittelson & Associates, Inc Project # 7059 Cornelius Wal-Mart Cornelius, Oregon 2006 Background Traffic Conditions Weekday PM Peak Hour	tes, Inc Pr art - Corneliu	Project # 7059 ius, Oregon Weekday PM Peak Hou	
Scenario:	Scenario Report bkpm		Impact	Impact Analysis Report Level Of Service		
Command: Volume: Geometry: Impact Fee:			Intersection # 1 Pacific Ave/Mountain View Ln	Base Del/ V/ LOS Veh C B 12.2 0.649	Future Del/ V/ LOS Veh C B 12.3 0.677	Change in + 0.084 D/V
Trip Generation: Trip Distribution: Paths:			# 2 W Baseline St/4th Ave	B 10.9 0.653	в 11.2 0.688	+ 0.308 D/V
Routes: Configuration:			# 3 W Baseline St/10th Ave	В 14.0 0.686	B 14.4 0.719	+ 0.401 D/V
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			# 5 N Adair St/10th Ave # 6 N Holladay St/10th Ave	B 13.6 0.721 B 10.8 0.000	B 15.8 0.738 B 10.8 0.000	+ 0.224 b/v + 0.000 b/v
			# 11 Pacific Ave/Quince St	D 36.4 0.854	D 36.4 0.854	4 0.000 b/v
			# 15 W Basline St/N Yew St	F 54.9 0.000	F 69.9 0.000	+14.950 D/V
			# 24 N Adair St/N Yew St	F OVRFL 0.000	F OVRFL 0.000	4 0.000 b/v
			# 52 S 4th Ave/S Heather St	A 7.4 0.107	A 7.4 0.107	+ 0.000 V/c
			# 53 S 10th Ave/Dogwood St	в 12.5 0.000	B 12.5 0.000	4 0.000 b/v
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Kittelson & Ass Cornelius L 2006 Background Traf	Level 2000 HCM Operati	rsection #1 Pacific Ave	Cycle (sec): 100 Loss Time (sec): 12 () Optimal Cycle: 56	Approach: North Bour Movement: L - T -	Control: Split Ph Rights: Inclu Min. Green: 0 0 Lanes: 1 0 0	Module: 0 : 106 Adj: 1.06 Coss: 0 Coss
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**************************************	Level Of Service Computation Report 2000 HCM Operations Method (Future Volume Alternative) ************************************	Level Of Service Computation Report 2000 HCM Unsignalized Method (Future Volume Alternative) ***********************************
Cycle (sec)	p. (X): ec/veh):	Average Delay (sec/veh): 5.6 Worst Case Level Of Service: F[69.9] ***********************************
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Section 3

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2006	Kittelson Corneli Background Tra	telson & Associates, Inc Cornelius Wal-Mart (und Traffic Conditions	či	Cornelius, Cornelius,	ect #7059 Oregon ay Midday	Peak	Hour	: : : :	2006		Kittelson & Associates, Il Cornelius Wal Mart Background Traffic Conditions	on & As elius W Traffic	Associates, Wal-Mart ic Conditio	2 :	Corneli	Project #705 Cornelius, Oregon Saturday Midday	O	Peak Ho	Hour	1
***	Level perat	Of Service Computation Reportions Method (Future Volume Al.	Computa (Future	tion Rer Volume	Att	ernative) ********	***	****	************	2000 HCM	***	evel Of eration ******	Level Of Service Operations Method	O ~ *	rtat r***	tion Report Volume Alternative) *********	: :ernativ :*****	*	******	* * * *
rsection	Intersection #3 W Baseline St/10th Ave	st/10th Ave	****	*****	*****	******	******	****	Intersection #4 N **********	ion #4 N	Ada ***	Adair St/4th	Ave ****	ir St/4th Ave ********************	*****	*****	****	***	******	****
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Approach: Movement:	North Bound	South Bound	puno '-	East	Bound T - R	_	West Bo	Bound T - R	Approach: Movement:		orth Bound	nd R	South	Bound T	- - -	East Bo	Bound - R	West	t Bound	~ 얼
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PHF Volume: Reduct Vol: Reduced Vol: PCE Adj: MLF Adj:	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	4834° <i>2</i>			820080			00000	Reduct Volume Reduced Vol PCE Adj: MLF Adj:		0.1.00 1.00 1.00 1.00 1.00			200120	5.5	1	00000		:	20000
Saturation F Sat/Lane: Adjustment: Lanes: Final Sat.:	low Module: 1900 1900 19 1.00 0.97 0. 0.00 1.00 1.	- 69-5	0.0	1900 190 0.78 0.7 0.12 1.8 179 280	00 1900 78 0.82 88 1.00	7 1900	1900	1900	Saturation Sat/Lane: Adjustment Lanes: Final Sat.		1900 1900 1.00 1845	1900	1900 15 1.00 0. 0.00 0.	1900 1900 0.90 0.90 0.42 0.58 727 982	90 1900 90 1.00 58 0.00	0000 0000 0000	1900	1900 1 0.92 0 0.13 1 224 3	1900 1 0.92 0 1.84 0 3216	1900 0.92 0.03 51
Capacity Ana Vol/Sat:	lysis Module: 0.00 0.06 0.07	0.06 0.08	0.00	0.50 05.0	50 0.02	2 0.00	0.00	0.00	Capacity Anal	Ana(ysis 0.06	Module 0.02	= 8.	0.00.0	0.03 0.0	.03 0.00	00.00	0.00	0.40	0**	0,40
Crit Moves: Green/Cycle: Volume/Cap: Delay/Veh: User Deladj: AdjDel/Veh: HCMZKAvg:	Crit Moves: Green/Cycle: 0.00 0.12 0.12 0.12 0.12 Volume/Cap: 0.00 0.50 0.63 0.52 0.65 Delay/Veh: 0.0 37.0 44.5 41.3 43.2 User DelAdj: 1.00 1.00 1.00 1.00 Adjbel/Veh: 0.0 37.0 44.5 41.3 43.2 HCM2kAvg: 0 3 4 3 4	0.12 0.12 0.12 0.52 0.65 41.3 43.2 1.00 1.00 1.00 41.3 43.2	00.00	0.77 0. 0.65 0. 5.2 5 1.00 1.	77 0.77 65 0.03 2 2.0 00 1.00	7 0.00 5 0.00 0.0 1.00	0.00	0.00	Crit moves: Green/Cycle: Volume/Cap: Delay/Vch: User DelAdj: AdjDel/Veh: HCMZKAvg:		0.12 28.7 1.00 28.7 28.7	0.00	0.00 0. 0.00 30 1.00 1. 0.0 30	0.12 0.12 0.24 0.24 30.5 30.5 1.00 1.00 30.5 30.5 30.5 30.5	24 0.00 .5 0.00 .5 0.00 .5 0.00 .5 0.00	0.00	0.00	0.76 0 0.53 0 4.0 1.00 1 7.0	*	0.76 0.53 4.0 1.00 4.0

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, 2005 14: s, Inc	2006 Background Traffic Conditions Saturday Midday Peak Hour Level Of Service Computation Report ***********************************	Approach Approach	Page 4 of 6
, 2005 14:22:11 s, Inc Project	ornetius, oregenerated Market	Cycle (sec):	s-105 2:22p

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Page 5 of 6

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Traffix 7.7.1115 (c) 2004 Dowling Assoc. Licensed to KITTELSON, PORTLAND

Page 10-1	Peak Hour	1.00)	***********	: E[38.2]	West Bound		0 0 0 0 0	10100	000	-09	0.94 0.94 0.94 0.94 0.94 0.94		XXXX XXXX XXXX XXXX		XXX	XXXX XXXX XXXX		xxx xxx x	* * * * * LT - LTR - RT			
:22:11	Project #7059 Cornelius, Oregon Saturday Midday Peak Hour	Level Of Service Computation Report 2000 HCM Unsignalized Method (Future Volume Alternative) ************************************	Intersection #15 W Basline St/N Yew St ************************************	Average Delay (sec/veh): 2.4 Worst Case Level Of Service: E[38.2] ************************************	East Bound		0 1 0 1 0		32 1373 19	1440	1.00 1.00 1.00 0.94 0.94 0.94 34 1531 20	1531			XXX	900 XXXX XXXXX 900 XXXX XXXX 0-04 XXXX		××	A * * * LT - LTR - RT	2 xxxx xxxxx	· ×	
Tue Aug 23, 2005 14:22:11	٤ ٢	Level Of Service Computation Report Isignalized Method (Future Volume Al ************************************	:/N Yew St	2.4 Worst Case	South Bound		0 1 0 0 0	48 15 0		ο 52 (0.94 0.94 0.94	05	7.1 6.5 xxxxx	- :	844 1621	228 99 xxxxx 0-23 0-16 xxxx		xxx xxxx x	* * * * * LT - LTR - RT		38.2 E	
1	Kittelson & Associates, In Cornelius Wal-Mart 2006 Background Traffic Conditions	Level C 2000 HCM Unsignali	n #15 W Basline St	ay (sec/veh): *********	North Bound		0 0 0 1 0	-ii	0 0	0 0 17	1.00 1.00 1.00 0.94 0.94 0.94 0 18 15	၁ဝ ည	p Module: :xxxxx 6.5 6.2	0.4	1610	xxxx 104 596 xxxx 100 396 xxxx 0 18 0 04	lodule:	Queue: xxxxx xxxx xxxxx Stopped Del:xxxxx xxxxx	: * * * * LT - LTR - RT	XXX XXXX	35.5 E	
bksa	5006	*****	Intersectio	Average Del	Approach:	Control:	kignts: Lanes:	Volume Module Base Vol:	Initial Bse: Added Vol:	Initial Fut:	User Adj: PHF Adj: DHF Volume:	Reduct Vol: 0	Critical Gap Modu	FollowUpTim:xxxxx	Capacity Module: Cnflict Vol: xxxx	Move Cap.: Volume/Cap.	Level Of Se	Queue: Stopped Del	LOS by Move: * Movement: LT -	SharedQueue:xxxxx Shrd StpDel:xxxxx	Shared LOS: ApproachDel ApproachLOS	
9-1	3 3 1 1 1	****	****	<u>~</u>	* * * * *	ound - R	ted	0 0		136	004	← 0		-	1.00	10001	-0-	1599	0.09		14.6 1.00 14.6 3	* * * * * * * * * * * * * * * * * * * *
Page	ak Hour	t ternative) ************	***********	779.0	**************************************	West Bound	Protected	1 0 2 0		1.01 1.01 272 869		1.00 1.00 0.93 0.93		-	1.00 1.00 292 934	1001 1001	0.94 0.94	787 3574	0.16 0.26		38.6 18.1 1.00 1.00 38.6 18.1 10 10	* * * * * * * * *
	t #7059 egon Midday Peak Hour	: :ernative)	****	(X):	******	ound R	ted	pass 0 1 0 1	=	 25.		1.00		•	6.5	_	0.93	_	0.25 0		0.0 0.0 8 8 - 8	* * * * * * * * * * * * * * * * * * * *
2:11	်ခွင့် နှင့်		*****	Vol./Cap.	Service:	East Bo		0 0 1 0 1	105 733	.01 1.01 106 740	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1.00 1.00	114 796	•	114 796	1000 1000		787 3224	0.06 0.25	0.12 0.36 0.54 0.68	44.1 28.2 1.00 1.00 44.1 28.2 4 12	* * * * * * * * * * * * * * * * * * * *
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Tue Aug 23, 2	Kittelson & Associates, Inc. Cornelius Wal-Mart C ground Traffic Conditions	Service C Method (ince St ******	0 (202)		South Bound L - T -	Protected	1 0 0 1	1	1.01 1.01 126 114	002	ر 0	136 123	~	1.00 1.00 136 123	1000 1000		1736 1039	0.08 0.12	53	41.5 44.7 1.00 1.00 41.5 44.7 5	***
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	Kittelson & Associates, I Cornelius Wal-Mart Background Traffic Conditions	**************************************	Intersection #11 Pacific Ave/Quince St	100	***	North Bound	. ()-	1001	:	1.01 1.01 65 78	00,	1.00 1.00 0.93 0.93	70 0 0 0	.03 .08 .08	1.00 1.00 70 84	Saturation Flow Module:	0.91 0.96	736 1828	ysis Module: 0.04 0.05 0.	.06 0.09	62.7 47.2 1.00 1.00 62.7 47.2 4 3	* * * * * *
	2006 Ba	20***	*****	sec):	Cycle:	::	<u>-</u> : :	- eeu:	—Φ		ol: 3yvol:			ا: اه	:	ion Flor					/eh: 6. ! Adj: 1 'Veh: 6.)************************
bksa		*****	Intersec	Cycle (sec):	Optimal ******	Approach: Movement:	Control	kignts: Min. Green: Lanes:	Volume Mo Base Vol:	Growth Adj: Initial Bse:	Added Vol: PasserByVol:	User Adj: PHF Adj:	PHF Volume: Reduct Vol:	Reduced Vol	MLF Adj: Final Vol.:	Saturation	Adjustment	Final Sat.:	Capacity Vol/Sat:	Green/ Volume	Delay/Veh: User DelAdj: AdjDel/Veh: HCM2kAva:	* !* !* !*

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Spinister School St.

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_	Project us, Oreg urday Mi	Repor	* + -	* 6	9-	ontr Incl	0	 500	000	1.0°.	000		XXX:	XXX			žž	- LTR	XXX	×× ×	**
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23,	ociates, In -Mart Conditions	vice (ethod	St *****	***********	- 1	op S Incl		2.4.	0 5	~0	90 y		4.1	1475 124	122 0.38		$\times \times$	٦ ٦	XXX	×× ×	43.4 E
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=	Kittelson & Associates, I Cornelius Wal-Mart Background Traffic Conditions	Level (signal	r St/	* * * * * * * * * * * * * * * * * * * *	2 - E	o de O de O	_ 0	200	000	.98	000			XXXX	XXXX		XXXXX XXXX XXXXX	* 🗠	XXXXX		
	Corr	L ST	**************************************	**************************************	<u>- 1</u>	용드	19	 1.0	000	9.0	202	•••	4.0	1500 122	120 0.18	odule	XXX XXX	L1 *		š*	38.4 E
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	2006	** ** **	ntersection #24 N Adair St/N Yew ***********************************	*****	: ::	<u>.</u>	odul.	Adj: L Bse:	cess:	 	Volume: uct Vol:	al Gap	mt TqC			evel Of Service Module:	Y Del:x	Move:	Cap.:	rpbel:	** **
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Oregon Department of Transportation

Transportation Development Branch

Transportation Planning Analysis Unit

Major Street: N. ADAIR ST

Project: Cornelius Wal-Mart

Year: 2006 Background

Minor Street: N. YEW ST

City/County: Cornelius OR

Alternative: Weekday PM Peak Hour

Year: 200)6 Backgrou	nd	Alternative:	Weekday PM	Peak Hour		
	Preli	minary Sign	al Warrant ^v	Volumes 💎			
Num	ber of		najor street	ADT on minor	street, highest		
Approa	ach lanes		ning from	approa	aching		
		both di	rections	vol	ume		
Major	Minor	Percent of star	ndard warrants	percent of stan	dard warrants		
Street	Street	100	70	100	70		
	Cas	e A: Minimu	<u>m</u> Vehicular	Traffic			
1	1	8,850	6,200	2,650	1,850		
2 or more	1	10,600	7,400	2,650	1,850		
2 or more	2 or more	10,600	7,400	3,550	2,500		
1	2 or more	8,850	6,200	3,550	2,500		
Whenty British and the state of	Case B:	Interruptio	n of Continu	ous Traffic			
1	1	13,300	9,300	1,350	950		
2 or more	1	15,900	11,100	1,350	950		
2 or more	2 or more	15,900	11,100	1,750	1,250		
1	1 2 or more		9,300	1,750	1,250		
5.65% o	f the above AD	T volumes is ed	qual to the MUT	CD vehicles per	r hour (vph)		
10	00 percent of st	andard warrants					
	70 percent of sta	andard warrants ²					
Enter Anna State	Prelin	ninary Signa	l Warrant C	alculation			
	Street	Number of	Warrant	Approach	Warrant Met		
		Lanes	Volumes	Volumes			
Case	Major	2	10,600	17,860	No		
A	Minor	ı	2,650	1,150	100		

15,900

1,350

Reviewer and Date:

17,860

1,150

Case

В

Analyst and Date: CBT

Major

Minor

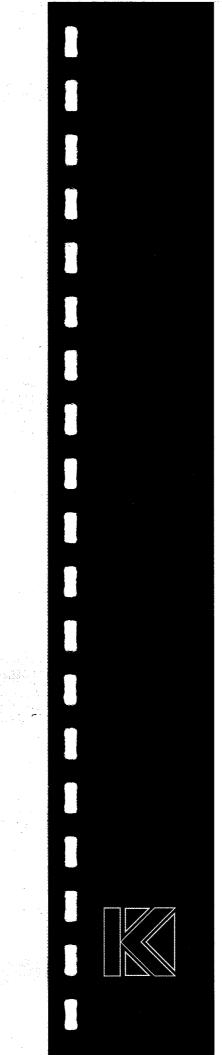
8.30.05

NO

¹ Meeting preliminary signal warrants does **not** guarantee that a signal will be installed. Before a signal can be installed a traffic signal investigation must be conducted or reviewed by the Region Traffic Manager. Traffic signal warrants must be met and the State Traffic Engineer's approval obtained before a traffic signal can be installed on a state highway.

² Used due to 85th percentile speed in excess of 40 mph or isolated community with population of less than 10.000.

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Appendix H

Year 2006 Total Traffic Level-of-Service Worksheets

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wsam	Tue Aug 23, 2005 14:22:34 Page 1-1	wsam Tue Aug 23,	9 23, 2005 14:22:35	5	Page 2-1
	, Inc P Corneli ions Wee	Kittelson & Associates, Inc. Cornelius Wal-Mart 2006 Total Traffic Conditions	ates, Inc Pr Mart Corneliu nditions Week	Project # 7059 Cornelius, Oregon Weekday AM Peak Hour	
Scenario:		Impact	Impact Analysis Report Level Of Service		1 3 4 5 6 1 1 1 1 1 1 1
Command: Volume: Geometry: Impact Fee:		Intersection # 1 Pacific Ave/Mountain View Ln	Base Del/ V/ LOS Veh C B 14.3 0.690	Future Del/ V/ LOS Veh C B 14.5 0.716	Change in + 0.201 D/V
Trip Distribution:	Weekcay Am With Site	# 2 W Baseline St/4th Ave	B 10.1 0.605	В 11.7 0.633	+ 1.605 D/V
Paths: Routes:		# 3 W Baseline St/10th Ave	в 13.0 0.657	В 13.4 0.673	+ 0.386 D/V
configuration:	woall work	# 4 N Adair St/4th Ave	A 7.0 0.414	A 9.5 0.446	+ 2.545 D/V
		# 5 N Adair St/10th Ave	B 11.1 0.428	B 11.3 0.461	+ 0.164 D/V
		# 6 N Holladay St/10th Ave	в 10.6 0.000	В 10.9 0.000	+ 0.289 D/V
		# 8 N Adair Street/RIRO Driveway	A 0.0 0.000	В 11.6 0.000	+11.635 D/V
		# 9 S Driveway/4th Ave/Barlow St	A 8.7 0.000	A 9.6 0.000	+ 0.957 b/v
		# 10 N Driveway/4th Ave	A 0.0 0.000	A 9.1 0.000	+ 9.109 D/V
		# 11 Pacific Ave/Quince St	c 33.1 0.681	c 33.7 0.701	+ 0.613 D/V
		# 15 W Basline St/N Yew St	c 22.6 0.000	c 24.2 0.000	+ 1.516 D/V
		# 24 N Adair St/N Yew St	c 24.0 0.000	D 26.5 0.000	+ 2.470 D/V
		# 52 S 4th Ave/S Heather St	A 7.3 0.047	A 7.3 0.053	+ 0.006 V/C
		# 53 S 10th Ave/Dogwood St	в 11.2 0.000	В 11.3 0.000	+ 0.098 D/V
Traffix 7.7.1115	Traffix 7.7.1115 (c) 2004 Dowling Assoc. Licensed to KITTELSON, PORTLAND	Traffix 7.7.1115 (c) 2004 Dowling Assoc. Licensed to KITTELSON, PORTLAND	ng Assoc. Licensed	to KITTELSON, PO	DRTLAND
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Tue Aug 23, 2005 14:22:35	elson & Associates, Inc Project # 7059 Cornelius Wal-Mart Cornelius, Oregon tal Traffic Conditions Weekday AM Peak Hour		Cycle (sec): 70 Critical Vol./Cap. (X): Loss Time (sec): 8 (Y+R = 4 sec) Average Delay (sec/veh): Optimal Cycle: 39	South Bound East Bound	Permitted Permitted	38 43 0 13 1156 779 1.01 1.01 1.01 1.01 38 43 65 25 0 65 -25 0 65 -25 0 0 0 22 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
WSam -	Kittelson & A Cornelius 2006 Total Traff	Level 2000 HCM Operati	Cycle (sec): 70 Loss Time (sec): 8 (Y+R Optimal Cycle: 39	Approach: North Bound Movement: L - T - R	Control: Permitted Rights: Include Min. Green: 0 0 0	Volume Module: Base Vol: Growth Adj: 1.01 1.01 1.01 Initial Bse: 0 5 0 Initial Fut: 0 79 104 User Adj: 0.088 0.88 0.88 Reduct Vol: 0 89 118 Reduct Vol: 0 89 118 Reduct Vol: 0 89 118 Reduct Vol: 0 89 118 Reduct Vol: 0 89 118 Saturation Flow Module: 0 89 118 Saturation Flow Module: 0 89 118 Capacity Analysis Module: 0 100 1.00 Final Sat: 0 0 182 1543 Capacity Analysis Module: 0 0 182 1543 Capacity Analysis Module: 0 0 182 1543 Capacity Analysis Module: 0 0 182 1543 Capacity Analysis Module: 0 0 182 1543 Capacity Analysis Module: 0 0 182 1543 Capacity Analysis Module: 0 0 182 1543 Capacity Analysis Module: 0 0 182 1543 Capacity Analysis Module: 0 0 182 1543 Capacity Analysis Module: 0 0 182 1543 Capacity Analysis Module: 0 0 182 1543 Capacity Module: 0 0 0 12 0 10 10 10 10 10 10 10 10 10 10 10 10 1	
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Page 10-1	nour	(e) ************************************	A[9.6]	West Bound L T R Stop Sign Include 0 0 1! 0 0	1.01 1.00 1.01 8	, PORTLAND
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Page 9-1	'n	/e) *********	Service: B[11.6]	West Bound L - T - R Uncontrolled Include 0 0 2 0 1	1.00 1.01 1.00	ITTELSON, PORTLAND
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12-1	1 1 1 1 1	Level Of Service Computation Report 2000 HCM Operations Method (Future Volume Alternative) ***********************************	***********	Loss Inme (sec): 16 (1+K = 4 sec) Average Delay (sec/veh): 53.7 Optimal Cycle: 69	Bound T - R	ted	0 0 _	52	1.01	vo!			>86.	96.8	3		J +		0.05			21.7	
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-- Project # 7059

Kittelson & Associates, Inc.

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Approach: Movement: Control: PHF Adj: PHF Volume:

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Kitte C 2006 Tot	a, e	_	Kittelson & Corneliu 2006 Total Traf	es, Inc Pr rt Corneliu itions Week	oject # 7059 s, Oregon day PM Peak Hour	
Scenario:	io R		Impact	Impact Analysis Report Level Of Service		
Command: Volume: Geometry: Impact Fee:	wspm wspm with site PM Default Impact Fee		Intersection # 1 Pacific Ave/Mountain View Ln	Base Del/ V/ LOS Veh C B 12.2 0.649	Future Del/ V/ LOS Veh C B 12.8 0.718	Change in + 0.611 D/V
Irip Generation: Trip Distribution: Paths:	weekday PM With sign Default Paths		# 2 W Baseline St/4th Ave	B 10.9 0.653	в 19.9 0.870	+ 8.952 D/V
Routes: Configuration:	Default Routes WSDM			B 14.0 0.686	15.4	+ 1.396 D/V
•	-		# 4 N Adair St/4th Ave	A 7.8 0.675	B 18.2 0.817	+10.426 D/V + 1.075 D/V
			9	_		+ 2.026 D/V
			# 8 N Adair Street/RIRO Driveway	A 0.0 0.000	E 35.6 0.000	+35.605 D/V
			# 9 S Driveway/4th Ave/Barlow St	A 8.9 0.000	c 15.2 0.000	+ 6.266 D/V
			# 10 N Driveway/4th Ave	A 0.0 0.000	A 9.8 0.000	+ 9.811 D/V
			# 11 Pacific Ave/Quince St	D 36.4 0.854	D 38.7 0.891	+ 2.260 D/V
			# 15 W Basline St/N Yew St	F 54.9 0.000	F 107.6 0.000	+52.729 D/V
			# 24 N Adair St/N Yew St	F OVRFL 0.000	F OVRFL 0.000	1,0000 b/v
			# 52 S 4th Ave/S Heather St	A 7.4 0.107	A 7.5 0.129	+ 0.022 V/C
-			# 53 S 10th Ave/Dogwood St	в 12.5 0.000	в 13.0 0.000	+ 0.542 D/V
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Kittelson & Associates, Inc Project # 7059 Cornelius Wal-Mart Cornelius, Oregon 2006 Total Traffic Conditions Weekday PM Peak Hour	Kittelson & Associates, Inc Project # 7059 Connelius Wal-Mart Connelius, Oregon 2006 Total Traffic Conditions Weekday PM Peak Hour
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mspm		**************************************	Cycle (sec Loss Time Optimal Cy	Approach: Control: Rights: Min. Green: Lanes: Min. Green: Lanes: Min. Green: Initial Bses Added Vol: PasserByVol: Initial Bse: Added Vol: PasserByVol: Finitial Fut: User Adj: PHF Adj: PHF Adj: Reducd Vol: Reducd Vol: Reducd Vol: Capacity Analy Vol/Sat: Capacity Analy Vol/Sat: Capacity Analy Vol/Sat: Capacity Analy Vol/Sat: Capacity Analy Vol/Sat: Capacity Analy Vol/Sat: Capacity Analy Vol/Sat: Capacity Analy Vol/Sat: Capacity Analy Vol/Sat: Capacity Analy Vol/Sat: Capacity Analy Vol/Sat: Capacity Analy Vol/Sat: Capacity Analy Vol/Sat: Capacity Analy Vol/Sat: Capacity Analy Vol/Sat: Capacity Analy Vol/Sat: Capacity Analy Vol/Sat: Capacity Analy Vol/Sat: Capacity Analy Adj: ApproachDel: Cos by Appr:	Traffix i

WSSa	Tue Aug 23, 2005 14:22:52	wssa Tue Aug 23,	23, 2005 14:22:53	3	Page 2-1
Z006 T	Kittelson & Associates, Inc Project # 7059 Cornelius Wal-Mart Cornelius, Oregon 2006 Total Traffic Conditions Saturday Midday Peak Hour	Kittelson & Corneli 2006 Total Traffi	es, Inc Pr irt Corneliu ons Saturda	oject # 7059 s, Oregon y Midday Peak Ho	<u>-</u>
Scenario:	rio Report	Impact	Impact Analysis Report Level Of Service		
Command: Volume: Geometry: Impact Fee:		Intersection # 1 Pacific Ave/Mountain View Ln	Base Del/ V/ LOS Veh C B 10.4 0.619	Future Del/ V/ LOS Veh C B 11.6 0.724	Change in + 1.154 D/V
Trip Generation: Trip Distribution: Paths:	Saturday : With Site Defaul: Paths	# 2 W Baseline St/4th Ave	A 9.9 0.594	c 26.1 0.932	+16.227 D/V
Routes: Configuration:			13.1		+ 2.077 b/v
		# 4 N Adair St/4th Ave	A 7.3 0.512	B 18.4 0.755	+11.105 D/V
		0 0		10.9	+ 1.345 D/V
		# 8 N Adair Street/RIRO Driveway	A 0.0 0.000	c 23.1 0.000	+23.116 D/V
		# 9 S Driveway/4th Ave/Barlow St	A 8.8 0.000	c 21.6 0.000	+12.787 b/v
		# 10 N Driveway/4th Ave	A 0.0 0.000	в 10.3 0.000	+10.347 b/v
		# 11 Pacific Ave/Quince St	c 28.3 0.677	c 30.1 0.732	+ 1.814 D/V
		# 15 W Basline St/N Yew St	D 34.1 0.000	F 59.6 0.000	+25.492 D/V
		# 24 N Adair St/N Yew St	E 40.2 0.000	F 86.2 0.000	+45.995 D/V
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Mest Bound	Intersection #1 Pacific Ave/Mountain View Ln ********************************** Cycle (sec): 100 Critical Vol./Cap. (X): Loss Time (sec): 12 (Y+R = 4 sec) Average Delay (sec/veh): Optimal Cycle: 63 Level Of Service:	**************************************	Intersection *************** Cycle (sec): Loss Time (s	"#2 W Baseline St ************************************	/4th Ave ************************************	**************************************	**************************************
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	2:22p				Page 2 of 7		***************************************

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Tue Aug 23, 2005 Kittelson & Associates, Inc. Cornelius Wal-Mart C	Saturday Midday Peak Hour Computation Report (Future Volume Alternative) ***********************************	New New New New New New New New New New	soc. Licensed to KITTELSON, PORTLAND	70594SSA.0UT 8-23-105 2:22p

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cct # 7059 Oregon iidday Peak Ho iidday Peak Ho iid	Tue Aug 23, 2005 14:22: Kittelson & Associates, Inc P Cornelius Wal-Mart Cornelius 2006 Total Traffic Conditions Saturd 2000 HCM Unsignalized Method (Future Vo ************************************
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Tue Aug 23, 2005 14:22:53	Kittelson & Associates, Inc Project # 7059 Cornelius Wal-Mart Cornelius, Oregon 2006 Total Traffic Conditions Saturday Midday Peak Hour Level Of Service Computation Report	2000 HCM Unsignalized Method (Future Volume Alternative) ***********************************	Uncontrolled Step Sign Step Step Step Step Step Step Step Step	
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200	Kittelson & Associates, Cornelius Wal-Mart 2006 Total Traffic Conditions	in in in in in in in in in in in in in i	Project # 7059 Cornelius, Oregon Saturday Midday Peak	9 ak Hour	2006	Kittelson & Cornelic Total Traffic	걸 ;	Project # 7059 Cornelius, Oregon Saturday Midday Peak Hour	ak Hour
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Intersection	Intersection #15 W Basline St/N Yew St ************************************	t/N Yew St	********	****************	Intersection	#24 N Adair St/	N Yew St	Intersection #24 N Adair St/N Yew St ************************************	*********
Average Dela	ay (sec/veh): *********	3.5 Worst Case	* Level Of Service	Average Delay (sec/veh): 3.5 Worst Case Level Of Service: F[59.6]	Average Delay	/ (sec/veh): **********	6.0 Worst Ca	Average Delay (sec/veh): 6.0 Worst Case Level Of Service: F[86.2]	F 86.7
Approach: Movement:	North Bound	South Bound	East Bound	West Bound	Approach: Movement:	North Bound	South Bound	East Bound	West Bound
		Stop Sign Include	Uncontrolled Include	Uncontrolled Include	Control: Rights: Lanes:	Stop Sign Include	Stop Sign Include 0 0 0 1 0	Uncontrolled Include	Uncontrolled Include
Volume Module Base Vol: Growth Adj: Initial Bse:	1.01 1.01 1	48 .01 48	32 1359 1 .01 1.01 1.0 32 1373 1	1.01 1.01 1.01	Volume Module Base Vol: Growth Adj: Initial Bse:	27 19 0 1.01 1.01 1.01 27 19 0	0 41 23 1.01 1.01 1.01 0 41 23	1.01 1.01 1.0	
Added Vol: In-Process: Initial Fut:	9400	10 00 15 15 15 10 10 10 10 10 10 10 10 10 10 10 10 10	0 198 0 0 67 0 32 1638 19		Added Vol: In-Process: Initial Fut:	9900	0000	0000	0 178 0 37 22 1435
PHF Adj: PHF Volume: Reduct Vol:	0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94	0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94	0.94 0.94 0.94 34 1742 20 0 0 0 37, 177,2	0.04 0.94 0.94	PHF Adj: PHF Volume: Reduct Vol:	30 0.90 0.90 30 2.1 0 0.90	0.90 0.90 0.90 0.57 2	0.0000000000000000000000000000000000000	
Critical Gap Module Critical Gp:xxxxx (FollowUpTim:xxxxx	Module: XXXXX 6.5 XXXXX 4.0	7.1 6.5 xxxx 3.5 4.0 xxxx	XXXXX	××××	cal Gap	₹'`''	xxxxx 6.6 6.3 xxxxx 4.1 3.4	x xxxx xxxxx	2.2
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Level Of Serving Stopped Del:	Vice Module: KXXXX XXXX XXXXX KXXXX XXXX XXXXX	* * * * * * * * * * * * * * * * * * *	**************************************	** *** **** ** **** *****	Level Of Service Module Level Of Service Module Queue: Stopped Del:xxxxx xxxx Loc by Moye: * *	Level Of Service Module: Queue: XXXXX XXXXX XXXXX Stopped Del:XXXXX XXXXX XXXXX	* * * * * * * * * * * * * * * * * * *	* * * * * * * * * * * * * * * * * * *	0.0 xxxx xxxxx 7.3 xxxx xxxxx
Movement: LT - LTR Shared Cap.: XXX XXXX	, 5	LT - LTR - RT 140 xxxx xxxxx	- LTR - RT XXXX XXXXX	- LTR	Movement: Shared Cap.:	106 xxxx	- LTR - R	LT - LTR XXXX XXXX	LT - LTR - RT XXXX XXXX
Shrd StpDel:xxxxx xxxx Shrd StpDel:xxxxx xxxx Shared IOS: * *		59.6 xxxx xxxxx 59.6 xxxx xxxxx	9.2 xxxx xxxxx 4.2 xxxx xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx	* * * * * * * * * * * * * * * * * * *	Shrd StpDel:	67.8 xxxx xxxxx	XXXXX XXXX 3.0 XXXXX XXXX 86.2	2 XXXX XXXX XXXXX 2 XXXXX XXXXX XXXXX XXXXX XXXXX XXXXX XXXX	7.3 xxxx xxxxx 4. * * *
ApproachLOS:		59.6 F		**		67.8 F		** ** *	XX
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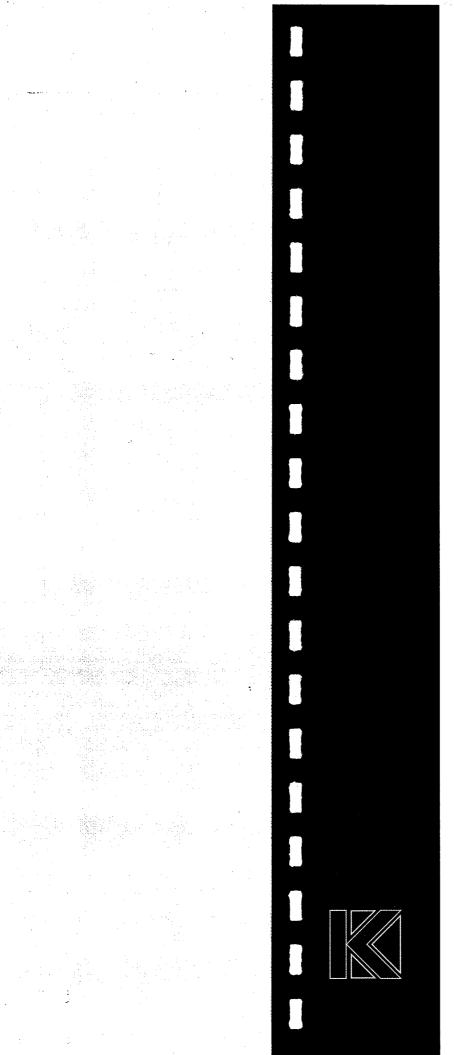
Oregon Department of Transportation

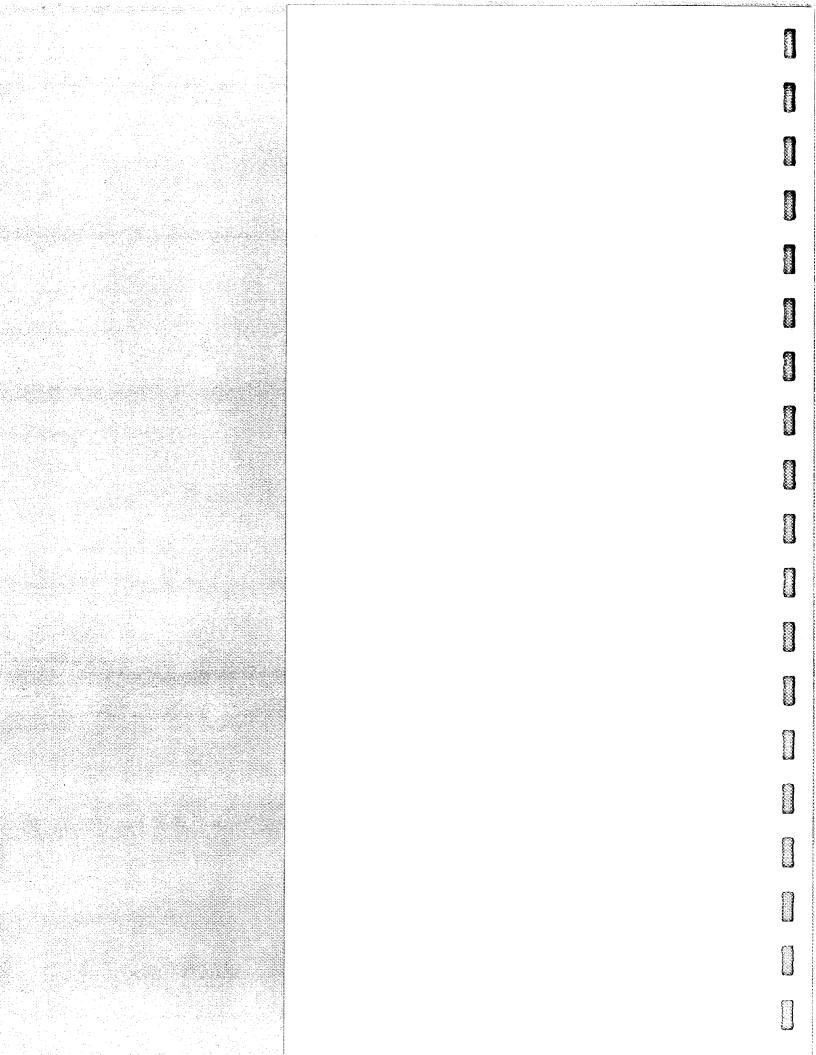
Transportation Development Branch
Transportation Planning Analysis Unit

Transportation Planning Analysis Unit								
	Preliminary Traffic Signal Warrant Analysis 1							
Major Stre	et: N. ADAIR		Minor Stree	NAMES AND ADDRESS OF THE PROPERTY OF THE PROPE	T			
	ornelius Wal		City/County					
Year: 200		- 1001						
200		minary Sian	al Warrant	Weekday PM P	eale How			
Num	ber of		najor street		. atuant bialant			
I	ich lanes		ning from	i	street, highest aching			
rippio	ich lanes		rections		ume			
Major	Minor		ndard warrants	percent of stan				
Street	Street	100	1 70	100	70			
			m Vehicular					
1								
2 or more	1	10,600	7,400	2,650	1,850			
2 or more	2 or more	10,600	7,400	3,550	2,500			
1	2 or more	8,850	6,200	3,550	2,500			
	Case B: Interruption of Continuous Traffic							
1	1	13,300	9,300	1,350	950			
2 or more	1	15,900	11,100	1,350	950			
2 or more	2 or more	15,900	11,100	1,750	1,250			
1	1 2 01 111010 13,300		9,300	1,750	1,250			
5.65% of the above ADT volumes is equal to the MUTCD vehicles per hour (vph)								
100 percent of standard warrants								
70 percent of standard warrants ²								
	Preliminary Signal Warrant Calculation							
	Street	Number of	Warrant	Approach	Warrant Met			
		Lanes	Volumes	Volumes				
Case	Major	2	10,600	19,200	NO			
A	Minor		2,650	1,210	, , ,			
Case	Major	2	15,900	19,200	NO			
В	Minor		1,350	1,210				
Analyst and	Date: CBT	8.30.05	Reviewer and	Date:				

¹ Meeting preliminary signal warrants does **not** guarantee that a signal will be installed. Before a signal can be installed a traffic signal investigation must be conducted or reviewed by the Region Traffic Manager. Traffic signal warrants must be met and the State Traffic Engineer's approval obtained before a traffic signal can be installed on a state highway.

² Used due to 85th percentile speed in excess of 40 mph or isolated community with population of less than 10 000





Appendix I

Queuing Analysis Worksheets

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Project Name: Project Number: Analyst:





KITTELSON & ASSOCIATES, INC.

610 SW Alder, Suite 700 Portland, Oregon 97205 (503) 228-5230 Fax: (503) 273-8169

Analyst: Date: Filename:

8/29/2005

H:\projfile\7059\excel\Queuing\[7059_Queue_Adair_4th.xls]WSAM

Intersection:

Conditions (yr, alt., etc.):

North Adair Street/North 4th Avenue 2006 Total Traffic - Weekday AM Peak Hour

GENERAL INPUT PARAMETERS:

Cycle Length:	70 sec
Confidence Level (C.L.):	95%
Storage length/vehicle:	25 feet

			API	PROACH/M	OVEMENT			
	#1	#2	#3	#4	#5	#6	#7	#8
	NBLT	NBTH	SBITH	SBRT			WBLT/TH	WBTH/RT
INPUT PARAMETERS:	į.		}					
Volume (pre-PHF) (vph):	68	96	58	15			522	469
G/C for movement:	0.13	0.13	0.13	0.13			0.75	0.75
Number of lanes:	.1	- 1	1	- 1			1	
CALCULATIONS:								
Length of red interval (sec):	60.9	60.9	60.9	60.9			17.5	17.5
Average total queue (veh):	1.2	1.6	1	0.3	1		2.5	2.
Maximum total queue (veh):	3	4	3	1			5	
Total queue length (feet):	75	100	75	25	1		125	12
Required storage/lane (feet):	75	100	75	25			125	
PERMITTED LEFT TURNS:					į		ļ	
Opposing volume (pre-PHF):	61							
Opposing sat. flow rate:	1697							i
CALCULATIONS:								
Opposing flow ratio (Yo):	0.04							
Unblocked G/C:	0.10				1			
Effective red interval (sec):	63.2				ĺ			
Average total queue (veh):	1.2						1	
Maximum total queue (veh):	3				·			
Total queue length (feet):	75						[
Required storage/lane (feet):	75							
	1]					

METHODOLOGY AND FORMULAS USED:

Length of red interval = (1 - G/C) * Cycle length

Average queue/lane = Volume * Red Interval / 3600

Maximum queue: Random arrival/Constant service Random arrivals behave according to a Poisson distribution. There is a probability equal to the confidence level desired (e.g. 95%) that the queue formed during each red interval will be less than or equal to the maximum queue.

(Prob. of arrivals = N) = (Red Interval)*N * exp(-N) / N! (the Poisson distribution) (Prob. of arrivals >= N) = 1 - Sum of probabilities for vehicles 0, 1, ..., N-1 Max N: Highest N such that the sum of probabilities > (1 - confidence level)

Queue length = Maximum queue * Storage length per vehicle

Required storage per lane = Queue length / Number of lanes, rounded up to the next highest whole vehicle

Opposing flow ratio Yo = opposing volume vo / opposing sat. flow rate sop

Project Name: Project Number:

Project Number Analyst: Date:



8/29/2005

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KITTELSON & ASSOCIATES, INC.

610 SW Alder, Suite 700 Portland, Oregon 97205 (503) 228-5230 Fax: (503) 273-8169

Intersection:

Filename:

Conditions (yr, alt., etc.):

North Adair Street/North 4th Avenue 2006 Total Traffic - Weekday PM Peak Hour

GENERAL INPUT PARAMETERS:

THE PROPERTY OF THE PROPERTY O	•
Cycle Length:	70 sec
Confidence Level (C.L.):	95%
Storage length/vehicle:	25 feet

			API	PROACH/M	OVEMENT			
	#1	#2	#3	#4	#5	#6	#7	#8
	NBLT	NBTH.	SB TH	SBRT			WBLT/TH	WBTH/RT
INPUT PARAMETERS:								
Volume (pre-PHF) (vph):	73	222	234	43				
G/C for movement:	0.16						1026	925
Number of lanes:	1	0.10		V.10			0.72	0.72
								,
CALCULATIONS:	-				Į.	į .		l l
Length of red interval (sec):	58.8	58.8	58.8	58.8	1	1	19.6	19.6
Average total queue (veh):	1.2	3.6	3.8	0.7			5.6	5.0
Maximum total queue (veh):	3	7	7	2			10	9
Total queue length (feet):	75	175	175	50	ĺ		250	225
Required storage/lane (feet):	75	175	175	50			250	225
PERMITTED LEFT TURNS:						!		ŀ
Opposing volume (pre-PHF):	234							Į.
Opposing sat. flow rate:	1900							
CALCULATIONS:								
Opposing flow ratio (Yo):	0.12					i		
Unblocked G/C:	0.12							l l
Effective red interval (sec):	67.1							
Average total queue (veh):	1.4							1
Maximum total queue (veh):	3							ı
Total queue length (feet):	75	ĺ						
Required storage/lane (feet):	75				·			
1.04400 Storageriane (reet).								

METHODOLOGY AND FORMULAS USED:

Length of red interval = (1 - G/C) * Cycle length

Average queue/lane = Volume * Red Interval / 3600

Maximum queue: Random arrival/Constant service
Random arrivals behave according to a Poisson distribution.
There is a probability equal to the confidence level desired (e.g. 95%)
that the queue formed during each red interval will be less than
or equal to the maximum queue.

(Prob. of arrivals = N) = (Red Interval)*N * exp(-N) / NI (the Poisson distribution) (Prob. of arrivals >= N) = 1 - Sum of probabilities for vehicles 0, 1, ..., N-1 Max N: Highest N such that the sum of probabilities > (1 - confidence level)

Queue length = Maximum queue * Storage length per vehicle

Required storage per lane = Queue length / Number of lanes, rounded up to the next highest whole vehicle

Opposing flow ratio Yo = opposing volume vo / opposing sat. flow rate sop

Project Name: **Project Number:**



KITTELSON & ASSOCIATES, INC.

610 SW Alder, Suite 700 Portland, Oregon 97205 (503) 228-5230 Fax: (503) 273-8169

Analyst:

Date: Filename:

Intersection:

8/29/2005

H:\projfile\7059\excel\Queuing\[7059_Queue_Adair_4th.xls]WSAM

Conditions (yr, alt., etc.):

GENERAL INPUT PARAMETERS

North Adair Street/North 4th Avenue 2006 Total Traffic - Saturday Mid-day Peak Hour

GENERAL INFOT PARAMETERS.		
Cycle Length:	70 sec	٦
Confidence Level (C.L.):	95%	
Storage length/vehicle:	25 feet	J

			API	PROACH/M	OVEMENT			
	#1	#2	#3	#4	#5	#6	#7	#8
r	NBLT	NBTH	SBITH	SBRT			WBLT/TH	WBTH/RT
INPUT PARAMETERS:								
Volume (pre-PHF) (vph):	81	352	297	27			765	75
G/C for movement:	0.27	0.27		0.27			0.62	
Number of lanes:	1	1	1	1			1	
CALCULATIONS:								
Length of red interval (sec):	51.1	51.1	51.1	51.1	l		26.6	26.6
Average total queue (veh):	1.1	5.0	4.2	0.4			5.7	5.6
Maximum total queue (veh):	3	9	8	2			10	10
Total queue length (feet):	75	225	200	50	l		250	
Required storage/lane (feet):	75	225	200	50			250	250
PERMITTED LEFT TURNS:								
Opposing volume (pre-PHF):	297							
Opposing sat. flow rate:	1862							
CALCULATIONS:								
Opposing flow ratio (Yo):	0.16							
Unblocked G/C:	0.13							
Effective red interval (sec):	60.8							
Average total queue (veh):	1.4						ŀ	
Maximum total queue (veh):	4							
Total queue length (feet):	100							
Required storage/lane (feet):	100							
Required storage/lane (feet):	100							

METHODOLOGY AND FORMULAS USED:

Length of red interval = (1 - G/C) * Cycle length

Average queue/lane = Volume * Red Interval / 3600

Maximum queue: Random arrival/Constant service Random arrivals behave according to a Poisson distribution. There is a probability equal to the confidence level desired (e.g. 95%) that the queue formed during each red interval will be less than or equal to the maximum queue.

(Prob. of arrivals = N) = (Red Interval)^N * exp(-N) / N! (the Poisson distribution) (Prob. of arrivals \geq N) = 1 - Sum of probabilities for vehicles 0, 1, ..., N-1 Max N: Highest N such that the sum of probabilities > (1 - confidence level)

Queue length = Maximum queue * Storage length per vehicle

Required storage per lane = Queue length / Number of lanes, rounded up to the next highest whole vehicle

Opposing flow ratio Yo = opposing volume vo / opposing sat. flow rate sop

Project Name: Project Number:

Analyst: Date:



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KITTELSON & ASSOCIATES, INC.

610 SW Alder, Suite 700 Portland, Oregon 97205 (503) 228-5230

Fax: (503) 273-8169

Filename: Intersection:

Conditions (yr, alt., etc.):

Baseline Street/South 4th Avenue 2006 Total Traffic - Weekday AM Peak Hour

GENERAL INPUT PARAMETERS:

ELLER OF THE BUILTER	<i>,</i>
Cycle Length:	70 sec
Confidence Level (C.L.):	95%
Storage length/vehicle:	25 feet

			API	PROACH/M	OVEMENT			
	#1	#2	#3	#4	#5	#6	#7	#8
	NBTH	NBRT	SBLT	SBTH	EBLT/TH	EBTH	EBRT	
INPUT PARAMETERS:			j .					
Volume (pre-PHF) (vph):	79	104	80	45	658	585	80	
G/C for movement:	0.12	0.12	The second secon					
Number of lanes:	1	1	ī	1	1	1		
CALCULATIONS:								
Length of red interval (sec):	61.6	61.6	61.6	61.6	16.8	16.8	16.8	
Average total queue (veh):	1.4	1.8	1.4	0.8	3.1	2.7	0.4	
Maximum total queue (veh):	3	4	4	2	6	- 6	2	
Total queue length (feet):	75	100	100	50	150	150	_	
Required storage/lane (feet):	75	100	100	50	150	150	1	
PERMITTED LEFT TURNS:			·					
Opposing volume (pre-PHF):		•	79					
Opposing sat. flow rate:			1828					
CALCULATIONS:								
Opposing flow ratio (Yo):			0.04					
Unblocked G/C:	1		0.08					
Effective red interval (sec):			64.4					
Average total queue (veh):			1.4					
Maximum total queue (veh):			4					
Total queue length (feet):			100					
Required storage/lane (feet):			100					

METHODOLOGY AND FORMULAS USED:

Length of red interval = (1 - G/C) * Cycle length

Average queue/lane = Volume * Red Interval / 3600

Maximum queue: Random arrival/Constant service Random arrivals behave according to a Poisson distribution. There is a probability equal to the confidence level desired (e.g. 95%) that the queue formed during each red interval will be less than or equal to the maximum queue.

(Prob. of arrivals = N) = (Red Interval)*N * exp(-N) / N! (the Poisson distribution) (Prob. of arrivals >= N) = 1 - Sum of probabilities for vehicles 0, 1, ..., N-1 Max N: Highest N such that the sum of probabilities > (1 - confidence level)

Queue length = Maximum queue * Storage length per vehicle

Required storage per lane = Queue length / Number of lanes, rounded up to the next highest whole vehicle

Opposing flow ratio Yo = opposing volume vo / opposing sat. flow rate sop

Project Name:

Project Number: Analyst:





KITTELSON & ASSOCIATES, INC.

610 SW Alder, Suite 700 Portland, Oregon 97205 (503) 228-5230 Fax: (503) 273-8169

Date:

Filename:

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Intersection:

Conditions (yr, alt., etc.):

2006 Total Traffic - Weekday PM Peak Hour

GENERAL INPUT PARAMETERS:

Cycle Length: 70 sec Confidence Level (C.L.): Storage length/vehicle:

			APF	PROACH/M	OVEMENT			
	#1	#2	#3	#4	#5	#6	#7	#8
	NBTH	NBRT	SBLT	SBTH	EBLT/TH	EBTH 1	EBRT	
INPUT PARAMETERS:								
Volume (pre-PHF) (vph):	88	76	232	143	899	707	.94	
G/C for movement:	10,22	0.22					100 C 100 C	
Number of lanes:	1	1	1	1	1	- 1	1	
CALCULATIONS:								
Length of red interval (sec):	54.6	54.6	54.6	54.6	23.1	23.1	23.1	
Average total queue (veh):	1.3	1.2	3.5	2.2		4.5		
Maximum total queue (veh):	3	3	7	5	10	8	2	
Total queue length (feet):	75	75	175	125	250	200	50	
Required storage/lane (feet):	75	75	175	125	250	200	50	
PERMITTED LEFT TURNS:								
Opposing volume (pre-PHF):			88					
Opposing sat. flow rate:			1900					
CALCULATIONS:								
Opposing flow ratio (Yo):			0.05				[
Unblocked G/C:			0.18					
Effective red interval (sec):			57.3					
Average total queue (veh):			3.7					
Maximum total queue (veh):			7					
Total queue length (feet):			175				'	
Required storage/lane (feet):			175					-
							l .	

METHODOLOGY AND FORMULAS USED:

Length of red interval = (1 - G/C) * Cycle length

Average queue/lane = Volume * Red Interval / 3600

Maximum queue: Random arrival/Constant service Random arrivals behave according to a Poisson distribution. There is a probability equal to the confidence level desired (e.g. 95%) that the queue formed during each red interval will be less than or equal to the maximum queue.

(Prob. of arrivals \approx N) = (Red Interval)^N * exp(-N) / N! (the Poisson distribution) (Prob. of arrivals \geq N) = 1 - Sum of probabilities for vehicles 0, 1, ..., N-1 Max N: Highest N such that the sum of probabilities > (1 - confidence level)

Queue length = Maximum queue * Storage length per vehicle

Required storage per lane = Queue length / Number of lanes, rounded up to the next highest whole vehicle

Opposing flow ratio Yo = opposing volume vo / opposing sat. flow rate sop

2006 Total Traffic - Saturday Mid-day Peak Hou

Project Name: Project Number:

Date:

Filename:

Analyst:



8/29/2005

Intersection: Conditions (yr, alt., etc.):



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KITTELSON & ASSOCIATES, INC.

610 SW Alder, Suite 700 Portland, Oregon 97205 (503) 228-5230

Fax: (503) 273-8169

GENERAL INPUT PARAMETERS:

Cycle Length: Confidence Level (C.L.): Storage length/vehicle:

70 sec 95%

			API	PROACH/M	OVEMENT			
	#1	#2	#3	#4	#5	#6	#7	#8
	NBTH*	NBRT	SBLT	SBTH	EBLT/TH	EBTH	EBRT	
INPUT PARAMETERS:								
Volume (pre-PHF) (vph):	97	62	291	93	988	659	76	
G/C for movement:	0.26	0.26	0.26			0.62		
Number of lanes:	1		7	1	1	1	1	
CALCULATIONS:								
Length of red interval (sec):	51.8	51.8	51.8	51.8	26.6	26.6	26.6	ļ
Average total queue (veh):	1.4	0.9	4.2	1.3	7.3	4.9	0.6	
Maximum total queue (veh):	4	3	8	3	12	9	2	
Total queue length (feet):	100	75	200	75	300	225	i i	
Required storage/lane (feet):	100	75	200	75	300	225	50	
PERMITTED LEFT TURNS:								
Opposing volume (pre-PHF):			97					
Opposing sat. flow rate:			1845					
CALCULATIONS:								
Opposing flow ratio (Yo):			0.05					
Unblocked G/C:			0.22					
Effective red interval (sec):			54.7					
Average total queue (veh):			4.4					
Maximum total queue (veh):			8					
Total queue length (feet):			200					
Required storage/lane (feet):			200					

METHODOLOGY AND FORMULAS USED:

Length of red interval = (1 - G/C) * Cycle length

Average queue/lane = Volume * Red Interval / 3600

Maximum queue: Random arrival/Constant service Random arrivals behave according to a Poisson distribution. There is a probability equal to the confidence level desired (e.g. 95%) that the queue formed during each red interval will be less than or equal to the maximum queue.

(Prob. of arrivals = N) = (Red Interval)'N * $\exp(-N) / N!$ (the Poisson distribution) (Prob. of arrivals >= N) = 1 - Sum of probabilities for vehicles 0, 1, ..., N-1 Max N: Highest N such that the sum of probabilities > (1 - confidence level)

Queue length = Maximum queue * Storage length per vehicle

Required storage per lane = Queue length / Number of lanes, rounded

Opposing flow ratio Yo = opposing volume vo / opposing sat. flow rate sop

Project Name: Cornelius Retail Center Project #: 7059

Analysis Scenario: 2006 Total Traffic - Weekday AM Peak Hour

Analysis Period: 0.25 (peak 15 minute analysis)
Analyst: CBT

Date: August 29, 2005

C = capacity of movement Q = 95th percentile queue (veh)

V = flow rate for movement

625000000 688000000 S = storage need (ft)

of Int: 3 ... 3 ... Veh. Length (ft): 3 ... 25

* Queue length calculated using Equation (17-37) presented in *Highway Capacity Manual 2000*.

INBRT SBLT SBRT EBLT EBRT WE	**************************************		718 1058 0.0	62 62 1000
NB LT NB.	North Adair Street / Right- C	Q V	Santa Harib Angal Personalis	North 4th Avenue / North 6 1556 Driveway Q 0.0

Project Name: Cornelius Retail Center

Project #: 7059

Analysis Scenario: 2006 Total Traffic - Weekday PM Peak Hour

Analysis Period: 0.25 (peak 15 minute analysis)

Analyst: CBT

Date: August 29, 2005

V = flow rate for movement

C = capacity of movement

Q = 95th percentile queue (veh)

S = storage need (ft)

* Queue length calculated using Equation (17-37) presented in *Highway Capacity Manual 2000* .

	NB LT	EL 8Z	NB.RT	SBLT	SB TH	SB.RT	E8 LT	HL 83	TA 83	WB	
North Adair Street / Right- C In Right-out Driveway S	> \(\text{O} \(\text{O} \)					224 343 4.4		Company Compan		2 - 1 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 -	
North 4th Avenue / N Barlow Street / South Driveway	C (1523 C 0.4 C 25						.14 379 0.1 25		195 981 0.7 25	.13 .258 .0.2 .25	
North 4th Avenue / North Driveway	C C 1485 S 0.1 S 25				And the second s		34 740 0.1 25	9	10 959 000		

Contraction of the Contraction o

Project Name: Cornelius Retail Center Project #: 7059

Analysis Scenario: 2006 Total Traffic - Saturday Mid-day Peak Hr

0.25 (peak 15 minute analysis) Analyst: CBT Analysis Period:

V = flow rate for movement

187 187 187

Q = 95th percentile queue (veh) S =storage need (ft) C = capacity of movement

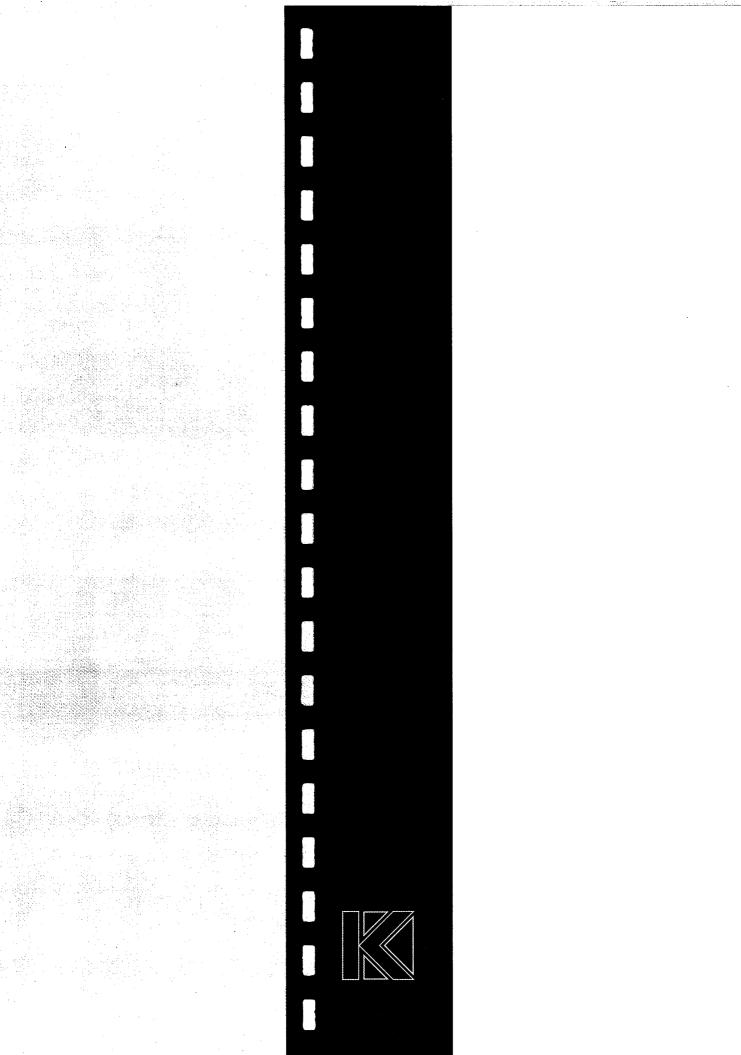
Date: August 29, 2005

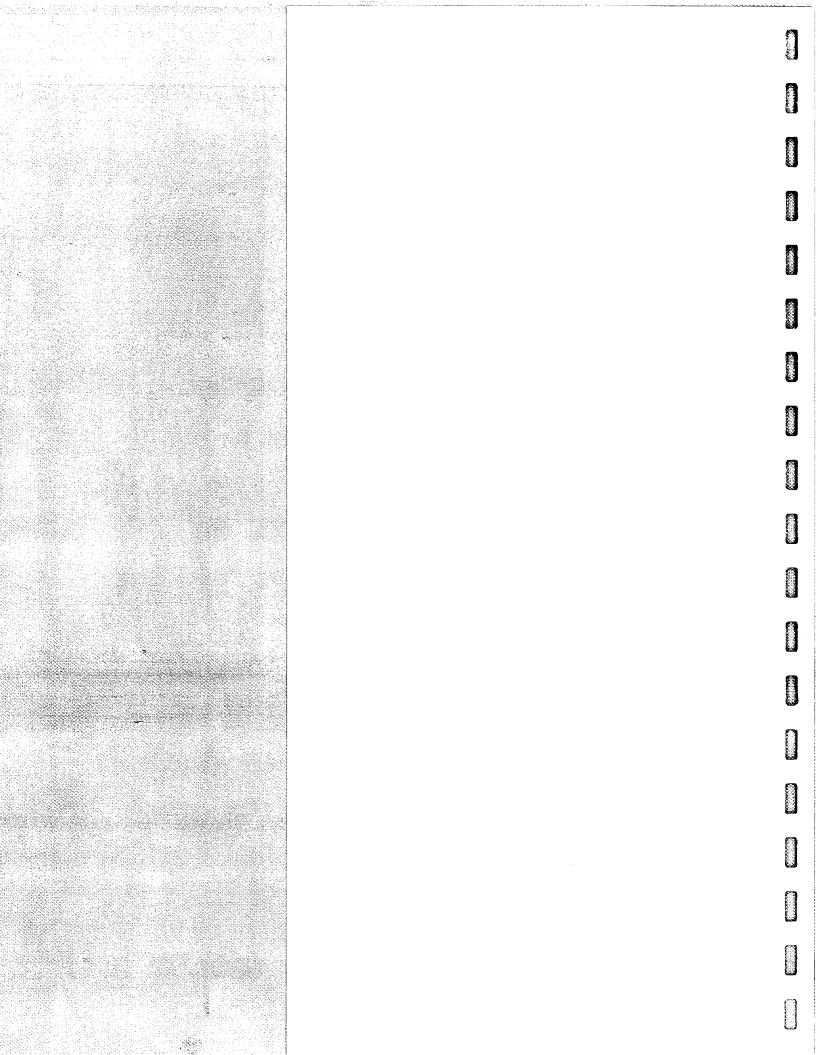
of Int: Veh. Length (ft):

* Queue length calculated using Equation (17-37) presented in *Highway Capacity Manual 2000*.

240 0.3 1.0 50 50 50 50 50 50 50 50 50 50 50 50 50	262 468 3.4	NB TH NB RT SB LT SB RH SB RT EB LT EB RT WB
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Appendix J

Alternative Access Scenario Worksheets

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Saturation Flow Module:

Page 1-1 ______ Kittelson & Associates, Inc. -- Project # 7059 Cornelius Wal-Mart -- Cornelius, Oregon 2006 Total Traffic Conditions -- Weekday PM Peak Hour Level Of Service Computation Report 2000 HCM Operations Method (Future Volume Alternative) ****************** Intersection #558 N Adair St/N 4th Ave - NO ACCESS **************************** Cycle (sec): 70 Critical Vol./Cap. (X):
Loss Time (sec): 8 (Y+R = 4 sec) Average Delay (sec/veh):
Optimal Cycle: 97 Level Of Service: Critical Vol./Cap. (X): 0.929 ****************************** Approach: North Bound South Bound East Bound West Bound Movement: L - T - R L - T - R L - T - R -----|
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 <th -----|-----||------| Volume Module: Base Vol: 72 20 0 0 30 43 0 0 0 144 1607 24 Initial Bse: 73 20 0 0 30 43 0 0 0 145 1623 24 Added Vol: 0 0 0 0 204 224 0 0 0 0 47 227 Initial Fut: 73 222 0 0 234 267 0 0 0 145 1670 251

Adjustment: 0.37 1.00 1.00 1.00 1.00 0.85 1.00 1.00 1.00 0.91 0.91 _____ Capacity Analysis Module: Vol/Sat: 0.11 0.13 0.00 0.00 0.13 0.18 0.00 0.00 0.00 0.64 0.64 0.64 Crit Moves: ****

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SIGNALIZED QUEUE ANALYSIS

Project Name: **Project Number:** Analyst:





KITTELSON & ASSOCIATES, INC.

610 SW Alder, Suite 700 Portland, Oregon 97205 (503) 228-5230 Fax: (503) 273-8169

Date: Filename:

Intersection:

8/29/2005

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2006 Total Traffic: WSPM (NO ACCESS)

GENERAL INPUT PARAMETERS:

Conditions (yr, alt., etc.):

Cycle Length: Confidence Level (C.L.): Storage length/vehicle:

	APPROACH/MOVEMENT							
	#1	#2	#3	#4	#5	#6	#7	#8
	NBLT :	NBTH	SBTH	SBRT	47275		WBLT/TH	WBTH/RT.
INPUT PARAMETERS:					ļ			
Volume (pre-PHF) (vph):	73	222	234	267			980	
G/C for movement:	10.19	A STATE OF THE PARTY OF THE PAR		0.19			0.70	1129 0.70
Number of lanes:	1.0		1	1				1
CALCULATIONS:								
Length of red interval (sec):	56.7	56.7	56.7	56.7			21.0	21.0
Average total queue (veh):	1.1	3.5		4.2			5.7	6.6
Maximum total queue (veh):	3	7	7	8			10	11
Total queue length (feet):	75	175	175				250	275
Required storage/lane (feet):	75			200	Į.		250	275
PERMITTED LEFT TURNS:								
Opposing volume (pre-PHF):	1210							
Opposing sat. flow rate:								
CALCULATIONS:								
Opposing flow ratio (Yo):								
Unblocked G/C:								
Effective red interval (sec):	1							
Average total queue (veh):						ļ		
Maximum total queue (veh):								
Total queue length (feet):								
Required storage/lane (feet):								

METHODOLOGY AND FORMULAS USED:

Length of red interval = (1 - G/C) * Cycle length

Average queue/lane = Volume * Red Interval / 3600

Random arrivals behave according to a Poisson distribution. There is a probability equal to the confidence level desired (e.g. 95%) that the queue formed during each red interval will be less than or equal to the maximum queue.

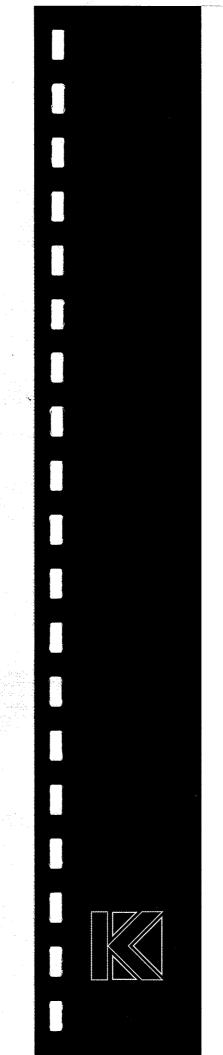
(Prob. of arrivals = N) = (Red Interval)^N $^{\bullet}$ exp(-N) / N! (the Poisson distribution) (Prob. of arrivals \Rightarrow N) = 1 - Sum of probabilities for vehicles 0, 1, ..., N-1 Max N: Highest N such that the sum of probabilities > (1 - confidence level)

Queue length = Maximum queue * Storage length per vehicle

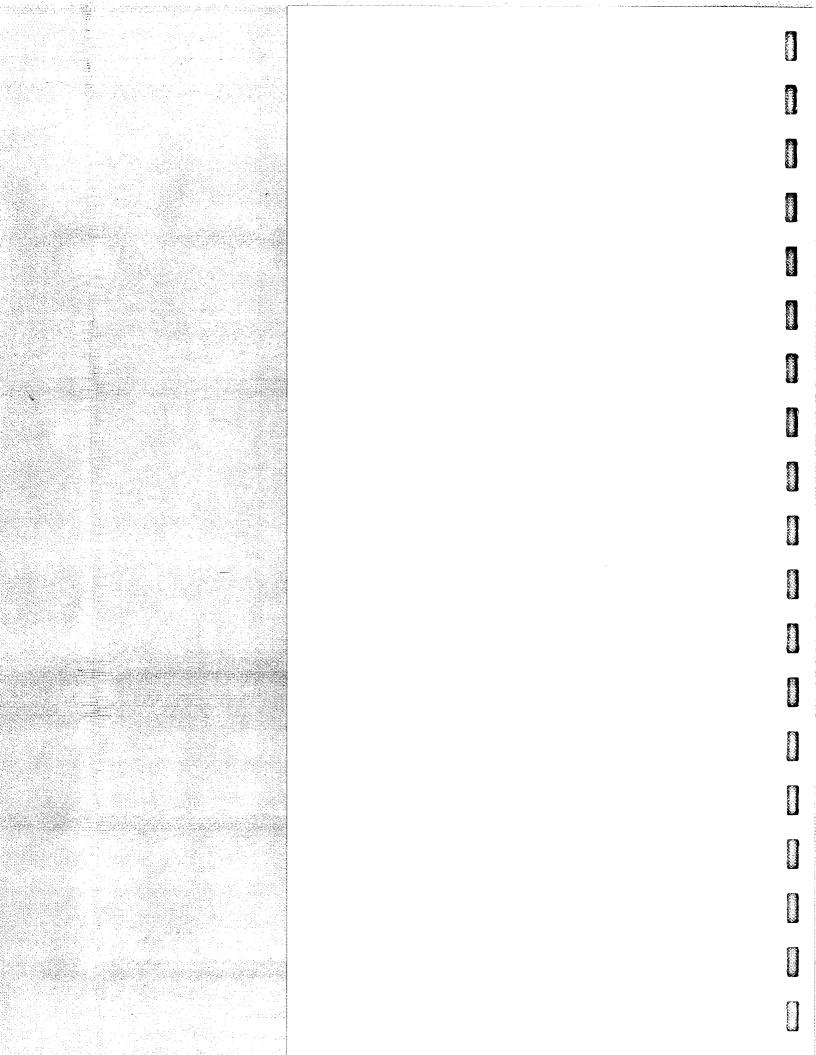
Required storage per lane = Queue length / Number of lanes, rounded up to the next highest whole vehicle

Opposing flow ratio Yo = opposing volume vo / opposing sat. flow rate sop

Unblocked G/C (gu/C) = $(g/C - Y_0)/(1-Y_0)$



1 140



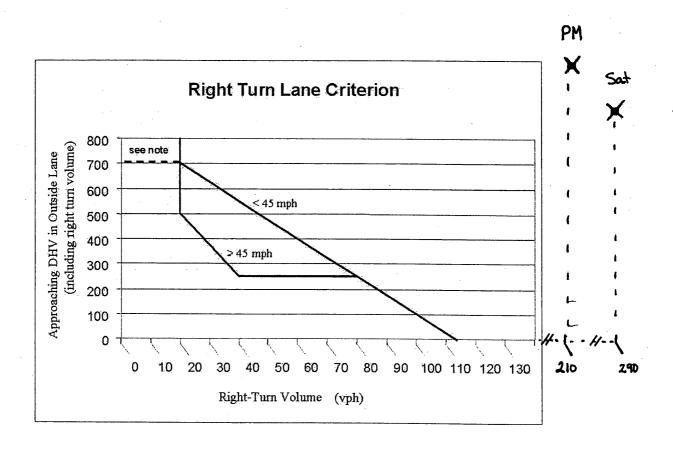
Appendix K

Turn Lane Warrants

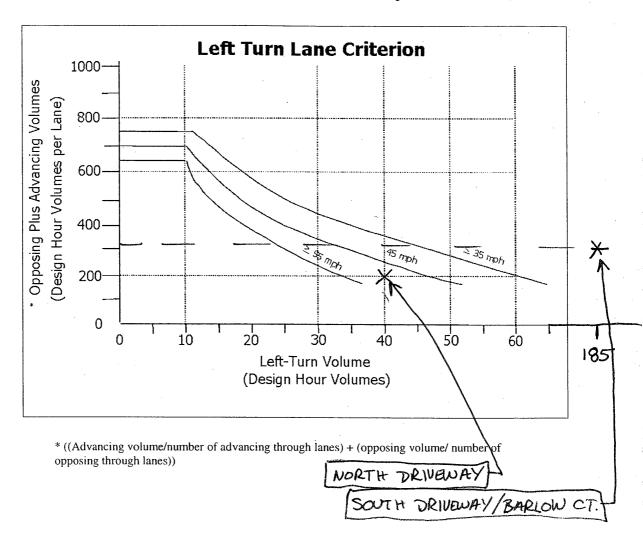
السنا Operation of the Control of the Cont Constant Constant Annahaman S Section 2 وروميوس Consumated St. وروستان المردور (موردوستان)

Right-Turn Deceleration Lane Warrant
. WB RT on N Adair Street (OR Hwy 8)

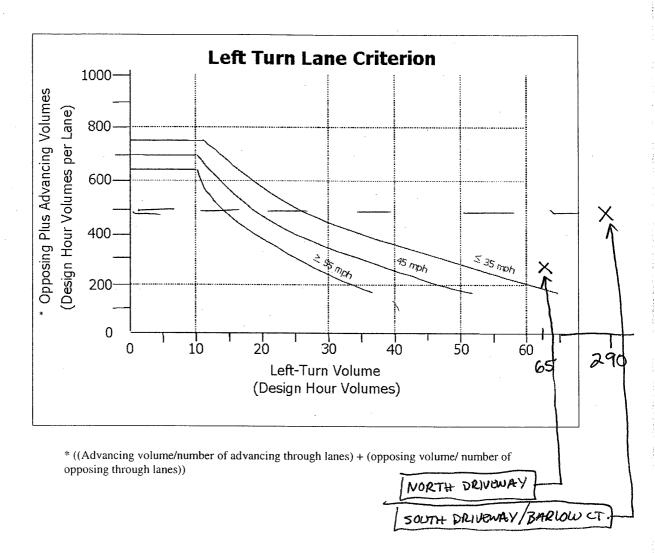
APPENDIX "J"
Date: 7/21/05
By: CBT



2006 TOTAL TRAFFIC CONDITIONS (WEEKDAY PM PEAK HOUR)



2006 TOTAL TRAFFIC CONDITIONS (SATURDAY MIDDAY PEAK HOUR)



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Appendix L

Truck Turning Movement Diagrams



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